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ABSTRACT

What experiences and knowledge acquired during the first five years of life will enable children to take full advantage of a formal education system during their growing years? The Conference on Early Childhood Intervention and Research examined available data within the theme "Programming Parents to Program Children." Topics and speakers for the five presentations include: (1) The family as an educational change agent-Earl Schaefer; (2) Environmental changes need for optimal child development-Burton White; (3) Contingency contracting with parents-Carl Haywood; (4) Procedures for the development of conceptual and thinking skills in children-Carl Bereiter; (5) The conference in perspective: New directions-Carl Haywood. Brief biographical summaries citing relevant research and field work involving each of the five panelist-psychologists are given. The conference proceedings have been edited tc preserve an informal narrative style. Discussion between panelists is reported along with questions from the audience. Final comments by Carl Haywood summarize and attempt to link individual presentations. References are given. (WY)

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PROCEEDINGS: EARLY CHILDHOOD INTERVENTION RESEARCH CONFERENCE

March 5 and 6, 1970

University of South Florida

Tampa, Florida

PRESENTED BY: INSTITUTE III: Exceptional Children and Adults

and

Early Childhood Education

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The facilitation of the successful adaptation of children to the regular school setting is of critical importance to professionals in many fields, and to parents. The goal is now to provide children with requisite experiences and knowledge during their first five years of life to enable them to take full advantage of a formal education system which will be their primary occupation during their growing years.

The conference on EARLY CHILDHOOD INTERVENTION and RESEARCH is being held to examine the available data in light of the conference theme: "Programming Parents to Program Children".

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BIOGRAPHICAL SKETCHES

DR. CARL BEREITER

Dr. Bereiter, Professor of Applied Psychology at the Ontario Institute for Studies in Education in Toronto, Canada, received his PhD from the University of Wisconsin in 1959. He is best known for his research concerned with teaching disadvantaged preschool children. Selected items from his vita include: Teaching Disadvantaged Children in the Preschool, 1966; Arithmetic and Mathematics, 1968; "Steps Toward Full Intellectual Functioning," Journal of Research and Development in Education, 1968.

DR. CARL HAYWOOD

Dr. Haywood received his AB and MA degrees from San Diego State College and his PhD from the University of Illinois. The latter, in psychology, was completed in 1961. Dr. Haywood is currently Kennedy Professor of Psychology at George Peabody College for Teachers in Nashville, Tennessee, where he is directing the doctoral training program for research scientists in mental retardation and the Institute on Mental Retardation and Intellectual Development. Dr. Haywood is the editor of the American Journal of Mental Deficiency, a consultant to the Scientific Review Committee of the Health Research Facilities Branch of the National Institute of Health, a member of the National Advisory Committee of the Research and Demonstration Center for Education of Handicapped Children at Columbia University and a permanent consultant to the President's Committee on Mental Retardation.

The development of personality and learning abilities in mentally retarded children and adults is one of his particular research interests. He rejects the notion that a person's later abilities have been determined by the time that person is born. By studying how individuals learn to behave in more or less intelligent ways, Dr. Haywood tries to identify the influences that determine the extent to which an individual realizes his genetic promise.

DR. LLOYD E. HOMME

Dr. Homme is the Manager of the Behavioral Systems Division for Westinghouse Learning Corporation in Alburquerque, New Mexico. He received his PhD from Indiana University in 1952. His major research interest involves the application of operant techniques and principles to the classroom and home settings. He has also had considerable experience in the area of programmed learning. Selected items from his vita include: "Human motivation and environment, " Kansas Studies in Education, 1966; and How to use contingency contracting in the classroom, 1969.

DR. EARL S. SCHAEFER

After receiving his doctorate in psychology at Catholic University in 1954, Dr. Schaefer began what was to become a very productive career in developmental psychology with the National Institute of Mental Health in Washington, D. C. He is currently Chief of the Section on Early

Childcare Research for the Center for Studies of Child and Family Mental Health at the National Institute of Mental Health. For a number of years, Dr. Schaefer has collaborated with Dr. Nancy Bayley at N.I.M.H. on the analyses of part of the Berkeley growth study data; and out of this work has come a series of important papers (Schaefer & Bayley, 1963; Bayley & Schaefer, 1964) dealing with the development of conceptual models of maternal and child behaviors and their various inter-relationships. And I know from personal experience that many researchers in psychology and education have found these models extremely useful in helping them to understand the extremely complex interactions that exist between the behaviors of children and the behaviors of those significant adults around them. More recently, Dr. Schaefer has become involved in early intervention research of which his tutorial project is perhaps best known.

DR. BURTON L. WHITE

Dr. White, Associate Professor of Education at Harvard University, received his PhD in psychology from Brandeis University in 1960. His area of interest is the role of experience in the ontogenesis of adaptive behavior in man. He has been involved in research, tracing the evolution of fundamental sensorimotor abilities of infants and the experimental modification of rearing conditions to determine the effects during the first six months of life. Dr. White is currently the Director of the Harvard Pre School Project which examines the etiology of optimal development in children from birth to six years of age.

Selected items from Dr. White's vita include: "Informal education during the first months of life," in J. Rosenblith & W. Allinsmith (Eds.) Causes of Behavior: Readings in Child Development and Educational Psychology, 1966; "Child development research: An edifice without a foundation," Merrill Palmer Quarterly, 1969; and he is preparing a book for Prentice Hall under the title, Experience and the Psychological Development of Human Infants.

EARLY CHILDHOOD INTERVENTION RESEARCH CONFERENCE

Introductory Remarks: Dr. James W. Barnard, Acting Director, INSTITUTE III: Exceptional Children and Adults

Let me open by extending you all a warm welcome to our Early Childhood Intervention Research Conference. I must say that the interest in this Conference has been quite impressive. We have people here with us this morning from nearly every area of the country, and even some people from as far away as Montreal, Canada. We also have people with us this morning with a wide variety of interests and from a wide variety of different professional disciplines. We have people, for instance, in the general field of developmental psychology; we have elementary school teachers; we have Head Start teachers and supervisors; school social workers; people involved in teacher training; and we have with us individuals in state departments of education from various states around the country and from the Office of Education in Washington, D. C. Now, I think it is quite obvious that a very important reason for this interest and enthusiasm is clearly the fact that we do have five very good people with us this morning at the Conference. Each of these individuals has already distinguished himself in a career; and each of these individuals will be able to talk to us on our Conference topic of programming parents to program their children from a wide range of experiences, ranging all the way from laboratory research to field research and experience. We are very fortunate, indeed, to have these five people with us. But, I think, somehow, that there is, perhaps, another reason why we have encountered a great deal of enthusiasm as we have been preparing for this Conference. I think that there is something in the times that makes people feel that the area of early childhood education and experience is, after all, one of the most exciting frontiers of our day. I think many people seem to respond this way, from the practitioner in the field who has been working hard for many years and is still somewhat dissatisfied with the results of his hard work, to the people at the highest levels of administrative responsibilities, which is most currently exemplified by President Nixon's proposal for the establishment of a national institute for education.

This new wave of concern and interest is not born because of evidence or belief that our current models of educating children are totally wrong; but rather, I think, this concern has developed from a realization that these models, these procedures, are incomplete; and they need to be expanded. Now, I believe that there are, at least, two directions in which these models can be expanded. First, is to recognize that the educational process really should not be limited to any arbitrary chronological age restrictions. The educational process, whatever that should be, should be extended down to, at least, birth and extended upward to death. Now, there obviously have been many current innovative programs that have moved in this direction. As examples, we could give our many pre-school programs. But, I think, perhaps, they have stopped short of the type of comprehensive total program that, in fact, we may find that we need.

Second, I think expansion of traditional programs should involve the recognition that the educational enterprise cannot be the total responsibility of professional educators. I think that, necessarily, if we are

planning to consider the education of very young children, say from birth to age three, we have to involve other individuals as part of the implementation of our educational delivery systems. Now, of course, these other people that I am talking about are family members of the young children that we are considering. It would seem to me that parents, particularly, have to be enlisted as implementers in our new comprehensive models of education, and not through the one-hour-a-month or one-hour-a-week type of consultations by a home visitor. I think this is not what we are talking about. We are talking about involving the parent as extensively and as systematically in our programs as we have already involved the children themselves.

I believe our conference participants, and I am sure you will agree with me, are well qualified to discuss these questions that are raised from these points of view. I think that the implications of our discussions this morning will have very important bearing on the traditional models of education that are already in use. And I further believe that the discussions we have during our conference will have some very important implications for the development of new educational models.

THE FAMILY AS AN EDUCATIONAL CHANGE AGENT

Presentation Made at Session I, Thursday Morning.

Chairman: Dr. James W. Barnard, Acting Director, INSTITUTE III: Exceptional Children and Adults

Speaker: Dr. Earl S. Schaefer

It's a rather grey morning to start a revolution, but I think what I would like to do this morning is try to convince you that, perhaps, we do need a revolution in education--a revolution that doesn't destroy the old structure but which enlarges it and expands it into a total approach to the whole field of education. Now, I think it's quite common that, in both professional and lay audiences, when you talk about education, immediately, we think of the education of the school-age child in the schools by the professional educator in the traditional academic subjects. Now, I think a comprehensive education system, a total education system, would be far broader than that. And I think that the field of education can provide leadership for broadening the bounds of education.

And that is why I would like to persuade you of this point of view and tell you of my experience in the field that leads me to this point of view. First, I would just like to read to you the Webster's (1967) definition of education: it includes the act or process of rearing or bringing up, it might even include parents, a process of providing knowledge, skill, confidence, usually desirable qualities of behavior and character. And that sounds far broader than the traditional educational goals of our public schools.

I would like to share with you some thoughts that I hope will help you imagine with me that there is a far broader field of education to which we could relate ourselves. And I think if we could imagine that; and then if we could decide that with our work, this broader field of education could really be developed and could really develop the potential of all children, I think we'll all move beyond that to really work at developing the total field of education. I really hope that educators will be the leaders in developing that total field of education which embraces the family, the community, the mass media.

At this point, I will take the liberty of giving a sort of historical review, because my work has really led to an evolution in my thinking; and I hope I can share that with you and, perhaps, see whether you will share this perspective with me.

My work in this field began in 1963, when I reviewed a monograph on Negro intelligence in the Southeastern states by Kennedy, Van de Riet, and White (1963); and in the article he claimed that there was a negative correlation between age and IQ. The older the children grew, the lower their IQ. Upon careful consideration of this study, I found that this was not true. Actually, these children came into school with a mean IQ of 81; and they went out with a mean IQ of 81, and the schools didn't change it. The schools were merely educating at the level that children come in.

Then I went into the literature on intellectual development further, and I was amazed to find that, in the norms for the Stanford Binet, the differences between occupational groups was as great for a group between two-and-a-half and five years as it is for any subsequent age level. So, again, the intellectual age level of children is established long before they hit the schools. And the schools aren't changing it. Then there were studies on language development in Switzerland in which they found tremendous differences in language skills at two and two-and-a-half by occupational groups, working class, middle class.

Hindley (1968), in London, did a study in which he tested children at six months, eighteen months, three years and five years, and reported that at six months and eighteen months, there were no differences in mental test scores by social class; but the differences were as great at three years as they were at five years. So, in this brief interval, in the second and third year of life, the differences between social class groups in their intellectual functioning had emerged. Now, of course, we all know that the IQ test is the best single predictor of academic achievement. The question is why is this true? And why do these differences emerge in the second and third year of life? If we look at the second and third year of life, clearly, at one a child has very little language. By the time he is three, he can carry on a conversation with an adult. And what does a child do in a school? He reads, he writes, he talks and he listens, and he thinks; and language is a tool. And what do we do in our middle-class occupations, including our activities here today? We read, we write, we talk, we listen, and we think; and language is our tool. So, I think, the reason these differences between social groups emerge in the second and third year of life is that it is the period of language development. Now, maybe that is old hat. But it was this kind of thinking which led me to look into IQ tests and ask what do they really measure? And it amazed me, that in a survey of the literature on intelligence tests, they found approximately thirty studies that had correlated vocabulary with total IQ score and found vocabularly typically correlates above 80 with total score. In fact, vocabulary correlates as well in the Stanford-Binet and the Wechsler-Bellevue as they correlate with one another. So, therefore, what our tests are measuring are largely language skills. And differences emerge in the second and third year of life; and schools are educating children at the level at which they come into the school; and, apparently, the schools have not been effective in changing that level of functioning.

This leaves us with the question, "What can we do about it? Where shall we move?" Now the question at the time I did this review, led to the idea of designing an infant education project. We decided that, since these differences emerged between approximately fifteen months and three years, we should begin tutoring children at fifteen months. We started sending tutors into homes for an hour a day, five days a week, to work with the children on their education. Now, we welcomed the participation of mothers; but we didn't insist on it, or push it too much. I think that was an error. Perhaps I'll tell you why a little later.

The tutorial program has this kind of philosophy: first, to educate a child, you must develop a positive relationship with the child and his

parents, since you work in the home; second, you have to provide varied and increasingly complex experiences, which can be done in many different ways, through books, toys, walks through the neighborhood and just conversation. There are thousands of ways of educating through these added experiences; and third, we felt that this experience had to be accompanied by language stimulation during this period. Perhaps you know of a comment by Cynthia Deutsch that migrant children have traveled extensively from state to state; and, yet, they have very little concept of time, space or geography. So they have had the experience; but the experience has not been shared, has not been communicated, has not been conceptualized; and that is why I think language stimulation was such an important part of our tutorial project.

So we began tutoring children at fifteen months with this kind of philosophy; and, really, we didn't have a curriculum. But the curriculum evolved as we moved through the program. The tutors were college graduates, both black and white, who had had some varied experience with young children and who developed appropriate methods for each individual child, for each age level. At one point, they attempted to describe this experience in curriculum items; but those things turned out to be very dull, so they finally wrote a set of essay descriptions of what they had done. They wrote essays on how you use books with the very young child, essays on puzzles, various toys, on trips, and, perhaps, twenty or thirty different aspects of infant education. They put on the front of this, "How to Educate Your Infant." That is rather an ambitious title. But, since an infant education cookbook doesn't exist yet, maybe this is a beginning.

Now, we found when we began this project at fifteen months that fifteen months is really a very late stage to begin education. We found some of our children were very apathetic, very passive, very withdrawn, were unable to relate. And so it took weeks and months at times to develop a relationship with the child. So education doesn't begin with language development. It begins with the development of relationships, and the development of interests and skills very early in life; and so we decided we began educating these children at a very late stage at fifteen months. Sometimes, it would take a great deal of effort to get through to a child to begin the educational process. One of the children never spoke, never smiled; and when I held him on my lap, he was absolutely rigid. Finally, we assigned a single tutor to work with this child who developed a technique of taking him on her rounds with her during the day when she went out to see other families. Within a month, she had thawed that child emotionally to a point where he began to smile; he began to talk; he began to participate; and he spoke approximately forty new words that month, even though he had hardly ever spoken before. So relationships were the beginning in this whole development. We were evaluating constantly the effects of this tutoring upon children.

Now, just to describe briefly some of the IQ test results of this project. We tested the children at fourteen months before the project began and found this group of working class, black, inter-city Negroes, as found in other groups, do not test below norms at fourteen months. In fact, they were somewhat above norms in the Bayley Infant Mental Test. However, it fascinated us that when we re-tested both

groups at twenty-one months, the control group had already dropped down to a mean IQ of 90; and they remained at that level right from twenty-one months through four years of age. So, already, you could begin to detect the effects of this early deprivation on test scores at twenty-one months, the time at which the test begins to largely measure language skills. Now, it fascinated us that, at twenty-one months, the experimental children, who had been exposed to this home tutoring project, had dropped somewhat below norms on the Bayley test. I think they were 97. But I would explain that finding in this way: that we hadn't begun early enough; and we had a lot of remedial work to do during that early period of tutoring. However, we were gratified when the IQ of the experimental group climbed during the next six months to 101, until, at three, the group had a mean IQ of 106 on the Stanford-Binet. And this was a group of lower social class, black ghetto residents, in the worst neighborhood of Washington, D. C. So I think this project, up to that point, had demonstrated that these children have intellectual potential which can be developed with only four hours a week special attention. At that point, we felt the project had been extremely successful.

Now, I would like to bring in our observations of parent behavior and child behavior which we had been doing concurrently. We felt we could use this study as a way of trying to replicate some of our earlier work on parent behavior in the social, emotional and cognitive development of children. And so, throughout the course of the project, we were collecting ratings on maternal behavior, descriptions of home environment, descriptions of the child's social-emotional behavior. I'll just briefly describe some of this work.

We had isolated a pattern of maternal behavior that consisted of a lack of verbal expressiveness with the child. This was the mother who was not talking with her child. Another element of this syndrome was low interest in the child's education. This was a mother who, when we came into the home, wouldn't relate to the tutor, didn't seem interested in what was happening with her child, didn't participate in educating her child, even though we welcomed this and encouraged it. And a third factor was a high detachment from the child. This mother was very distant, remote, not very involved with the child. The mother was hostile to the child. Now, these four variables of low verbal expressiveness, low interest in the child's education, hostility and detachment correlated highly with one another. We thought of this as a pattern of maternal hostile detachment.

Now, this pattern was related to another set of variables in maternal behavior that we isolated. We call it the syndrome of child neglect. And this child-neglect syndrome included leaving the child under three alone without any adult care or supervision, just leaving the child alone and inadequate day care. The child was put into anyone's home for care during the day, whether those people fed him or gave him any attention or care or not. Other elements associated with this syndrome were irregular meals; some of the children were not fed regularly, partially because there wasn't enough food in the house, but partially because the mothers would just be negligent about feeding them; inadequate clothing; sicknesses, which were usually respiratory and skin problems caused by physical neglect; accidents; and beatings. So this pattern verged on child abuse.

Also within this group of twenty-eight children that we studied intensively, it fascinated me that some of the children had experienced none of these child-neglect items perhaps six or seven children; and about six had experienced all of these child-neglect items. So there is tremendous variability in maternal care within a lower-class income group; and the tremendous variability is reflected by this child-neglect syndrome and, also, the maternal-hostile-uninvolvement syndrome.

Now, we also quantified the child's behavior in the test situation. We found a syndrome of hostile maladjustment of the child at three which included the child who is very belligerent, irritable, negativistic, with a great deal of negative affect. We called this a child-hostility syndrome.

Now, maternal-hostile uninvolvement and maternal neglect were related to the child's hostility and maladjustment; so this formed a clear syndrome at three, showing that the quality of maternal care was also influencing the child's behavior. But, further, it fascinated us when we had the blind evaluations for the testers who did not know of this home data at all, maternal-hostile uninvolvement and neglect and the child's hostile maladjustment in the home, as viewed by the tutors, were highly related with the child's low task oriented behavior in the test situation. The child would not cooperate, would not persist in solving a task, was not object oriented, just could not attend, persist or work with the material presented in the test situation; and, also, these children had low test scores. So at that point, we thought we saw very clearly that the quality of maternal care in the home influenced the child's development, social-emotional and cognitive development and, also his task-oriented behavior. We also thought we had found that the supplementary tutoring had influenced the child's development in a home on the test situation. So, in a way, this supplementary tutoring and the quality of maternal care are the same type of variables because the tutors were doing that which a good mother would do to a great extent. So we thought both of these things proved that the quality of early experience clearly influences the child's cognitive development.

Now, we discontinued the intensive, home-tutoring program at three, but had continued to test its effects at four and five; and it fascinated us that the IQs of the experimental group dropped back from 106 at three to 100 at four. So we see a regression in mental-test scores. There is a slight, additional regression, I think, at age five, although we haven't completed that testing. Now, the control group remained at 90 through age four; but at age five, their IQs have climbed a bit; and I think there may be two explanations for this. First, many of the control children went into schools, nursery schools and kindergartens; and those schools may be having an effect; but there is a more subtle thing here, I think, that may be happening within the control group at this point. We see, in the control group, that the mothers who felt their children had truly been included in an infant-education program are taking a great deal of interest in the education of their children, are really coming into the Center and observing the toys and books that are there, even taking notes on them and going home and buying them. The control mothers seem to be working more with their children, perhaps, than the experimental mothers are. I think that's rather sobering. With the

experimental group, we went in and we said, "We have the skills. We have the confidence, and we will educate your child implicitly by going and doing the job rather than working with the mother." And, now, we're having a very difficult time persuading the experimental mothers that, now, they should do the job, and that they have the responsibility for the care and education of their children, while the control mothers, merely being exposed to this testing situation, apparently, have assumed the responsibility to some extent themselves. And I think this is an extremely important point. I think, when we think of early child-development programs, they can be designed to support the educational efforts of parents; they can be designed to supplement the educational efforts of parents; or they can be designed to supplant the educational efforts of parents. And I think it would be a great tragedy if our structured programs looked to the parents as though we were supplanting their efforts. Instead, I think our stress should be very much upon supporting their efforts in the education of children.

Well, it was this kind of experience of the initial gains with the intensive home tutoring and the drop when we discontinued that tutoring that really made me re-think my position on early education. At this point, for example, I feel that Benjamin Bloom's, (1966), statement that fifty percent of the child's intelligence is developed by the age of four, is quite wrong. And I'll tell you why. Professor Bloom's conclusion was derived from children who were reared in their own homes from birth through maturity. Now, a home has a fairly stable educational atmosphere. If the parents educate early, they probably continue to educate later; and so you can, perhaps, predict, to some extent, how well a child is going to do if he continues to live in his own home at four years of age. But, if you were to have a radical change in environment of that child at four, I am quite certain, at this point, that you could not predict his future intellectual level from the test score at four. So maybe some of us have oversold the importance of early education. The fact that you get this regression in test scores after these intensive home tutoring programs or after these intensive nursery-school programs suggests that, perhaps, our emphasis has been misplaced upon early education. We need early and continuing education for all children, but much of this education must go on in the home and in the community.

Now, I'd like to review some of the studies which have led me to that conclusion. Perhaps you know the experience of other studies in which they have had early intensive programs has been that children's test scores regressed later. For example, Susan Gray's, (1968), is an excellent example. She found that with her nursery-school program where she worked with parents in the early years she got great gains in IQ; but over a period of years, after the intervention ended, she reported that the mean IQs of the experimental group, who had that intensive program, had declined ten points. I think the decline was ten points three years after the intervention ended, and she concludes from this that evidence on human performance is overwhelming in indicating that such performance results from the continual interaction of the organism with its environment. So there, she's stressing continuing education. And my question is, if she had continued to work with those parents during the school years, would she have had that regression? I would hope not. At least, I think that hypothesis should be tested.

Now, you know Betty Caldwell's, (1967), intensive day care program also has produced great changes in IQ. But in a paper at a Public Health Association meeting, she reported that tests administered a yea· after the children left the program revealed that their functioning level had shown a rather sharp drop from the point at which they had functioned just prior to leaving the program, although they still scored slightly higher than a group of controls. But, if one year after the intensive program ends, there is a sharp drop, if you extend that forward in time for several years, will there be any difference between groups that is significant? I doubt it.

Now, I'd like to point out that it's also possible for children to increase their intellectual levels at a later age with a better educational environment. Of course, you all know Klineburg and Lee's, (1938), early studies of children who came from the rural South into a Northern, urban environment. They found that there were IQ gains in the Philadelphia schools for all of the children at what age level they came in, although the gains were greater for the younger children. So, if you move a child from one educational environment or one total environment to another, you can get changes in IQ.

However, the most fascinating study to me was done by the Clarkes (1954), in England; and I think it has profound implications for the total field of education. They had a group of mentally retarded young adults, who had come from severely deprivin home environments; and they had followed these young adults over a six-year period. They reported of these mentally-retarded adults who had come from severely depriving home environments, their mean IQ had gone up sixteen points over a six-year period. Would that agree with Professor Bloom's statement that intelligence is formed and shaped irreversibly in the early years? I don't think so at all.

They also reported that the IQs of the young adults who came from less-deprived environments went up ten points over a six-year period. So, apparently, people can learn at any age if their environment supports that kind of learning. I now believe that, with a radical change in environment, we could get radical changes in intellectual functioning at any age. The question is, "What part of the environment should we be working in, and how do we do this?"

Now, I said at the beginning of this talk that it fascinates me that the mean IQ of every social group seems to be established before the children enter the schools, perhaps as early as three years of age; and the schools aren't changing it. Does that, perhaps, mean that the school doesn't have that powerful an influence, that the family and community environment is really shaping the rate of learning and rate of intellectual development? You know, when we think of education, let's think about language development again. Essentially, the child learns the language between one and three years of age. And when he has a language at three, he can carry on a conversation with an adult. Isn't that the most incredible education achievement that ever happens? And the schools aren't relating to it, so that there is a great deal of learning going on out in the family, in the community and through the mass media; and I think education should begin to relate to that learning

that is going on out there. I think that education should break down the equation that learning equals schooling and that learning occurs within the school walls and merely with a professional educator. I think, if we developed a different perspective, that learning goes on throughout the child's life experience, that learning goes on with the interactions of the parent and with other children, that learning goes on when the child is viewing television, that education could begin to relate far more heavily to that total-education system out there and could be much more effective. Is it possible that educators and teachers could begin to see themselves as the leaders of the educational team? If education doesn't take over this role of planning a total-education system that includes families and children and the mass media, who is going to do the job of leadership? So, I think we have to move beyond this narrow definition of the role of educator as merely teaching the individual child to really assuming the role of educational leadership.

Sesame Street, I think, is an interesting break. You know Sesame Street has pointed out to the total country that television can be used for educational purposes. I hope it is only the first of many, many adventures in trying to use television as an effective educational tool. And I hope in the next venture we devote a great deal of time to having parents relate to the child and his television viewing. It fascinated me when Wilbur Schramm told me that they did an experiment in which they had the children view TV programs in the schools with their parents and found the children had learned far more when they shared it with their parents. So it seems to me that we need to involve parents with their children so they'll be supporting their education.

Now, I'll briefly just mention some of the projects that have tried to work with parents that I think are encouraging. My own project, as I said, was far too child centered. I think future projects should be far more family centered and parent centered, and I think the schools will have to become far more parent centered and family centered. Right now I am afraid that schools and parents are not communicating very effectively. They really are not working together very closely, at least in my local area; and they really need to have this kind of recognition, that the family, as well as the school, is a major educational institution. These two major educational institutions must work together to foster the learning of children. I have already mentioned Susan Gray's work on nursery school education and working with parents. I think that was a very important pioneering study. You also probably know about David Weikart's(1967), work in which he had an intensive nursery school program and also worked with parents one day a week to have them continue to support the child's education. That program has been incredibly effective. Dave tells me that, over the last two years, they have managed to get a thirty point IQ gain in a single academic year with his intensive nursery school education and working with parents. It will be interesting to see whether he can maintain that kind of level.

But a recent study by Levenstein, (1968), in New York fascinates me mostly because of her very sharp focus on parent education. Levenstein conceptualized books and boys as a verbal interaction stimulus

material, and she chose those books and toys for young children that could be used to promote verbal interaction between the parent and child. She then took these books and toys into the home and demonstrated their use to mothers, then had the mother use them with the child under the supervision of the demonstrator and finally left them with the mother for her use. Levenstein reported in her early work with thirty-two visits over a seven-month period in which she left approximately twenty-four books and toys in each home that the children had gained seventeen IQ points. With a few children, she was able to maintain that intellectual level by visiting their parents only twice a month. Levenstein's program almost sounds like a socially-feasible program. Is it possible that we could really enroll children in the educational process at birth and that educators could move out and work with the parents on the early education of their child right from that point onward? Now, I realize this would take manpower; and it would take money; and that is why I am trying to persuade you that we should move in this direction. Because, if we really feel we should move in this direction, then we'll start to work at it.

Now, there is another project which fascinates me. Perhaps you have heard of the Don Stedman project in North Carolina in which he tested children repeatedly over a period of time. I think he tested once a month for the first three months, and then every three months until the children were two; and he found out that the children who had been exposed merely to that repeated testing maintained an intellectual level of approximately 100 at two. And, so, I wonder whether merely exposing the mother to the child in the testing situation so she sees what her child is capable of, sees some of the methods you might use to elicit a response from the child, becomes aware that cognitive development is important, whether that alone would motivate the mother and teach her to acquire an interest in her child's early cognitive development.

And, finally, what fascinates me about Nancy Bayley's, (1955), longitudinal group that she tested repeatedly throughout the school year was that the mean Wechsler-Bellevue IQ at maturity was 126, which is far above any group I know. I think she produced six MDs out of that sample of approximately sixty children. Further, I am quite sure that her longitudinal study heavily influenced those families of those children merely by her continuing interest in the child and the family. In physics, I think they call this the Heisenberg effect--by measuring something, you change it. Well, I think some of these programs may be really producing quite an effect upon families merely by interesting them and motivating them and teaching them some of the relevant criteria for the child's development.

One further point--I think we have also been trained to think of ourselves as students throughout the life span. I always thought of myself as a student, almost a professional student, through graduate school. But I think there is a shift to also recognizing that students are potentially teachers. If we could see in all children that they are both students and teachers throughout the life span, I think we would have a more dynamic and effective educational system. You know

a six-year old has all of the language that a three-year old needs; and a twelve-year old might teach a six-year old to read. So, I think we need to develop a new system in which everyone is recognized as both a student and a teacher throughout the life span. I still consider myself very much of a student and sometimes a teacher. I think that is a very exciting situation to be in because you are learning new things, and you are trying to communicate those things to others.

I think, really, that what I am trying to suggest is that we have to move outside of this field of academic education and go back and re-evaluate the education of the school-age child in the schools by the professional educator in the academic subjects to have a far broader concept of what learning and education is all about. You know, there is one thing that alarms me a bit about modern trends. Some people are proposing that we extend the academic education down to three for all children. That would be too late if you accept these results that I have been describing because every social group has largely established their own intellectual level by the age of three. And then other people are talking of extending education upward by having open-university enrollments for all people. So again, we extend academic education upward. So we extend academic education downward and upward, and we continue to do the same old thing. But, if we do that, I think that is going to consume all of our educational resources, all of our money and all of our manpower for the next twenty years. I wonder if we couldn't take a different tact, if we couldn't say education is going on in the family; it's going on with that mass media, particularly television; it's going on in the community. These children can help educate one another. And, really, we could try to develop that kind of perspective. And I think, if we have an idea that that might work, and if we develop the motivation to do that job, then we will find the money and the manpower to do it; and we will develop the methods and materials to do it; and, perhaps, we'll have an educational system that really might work. Thank you.

Discussion from Panelists.

Dr. Barnard:

Ladies and gentlemen, now that you've had a few minutes to digest the presentation this morning, I am sure that many of you have questions that you want to put to Dr. Schaefer. I am going to try to partition our question and discussion period into two parts. During the first part, I am going to ask for responses from the panel members to the presentation this morning; and then after that, I am going to throw open the meeting to questions from the audience.

Burton White:

First of all, I would like to say that Dr. Schaefer and I are essentially soulmates on these issues. Our values are the same. Our general conclusions about the enterprise of education are almost point for point identical, and I am just pleased to see someone as capable as he is who agrees with me. We have come to our conclusions partly on the basis of

similar evidence, but partly also from quite a different point of departure which is rather than looking at the practical societal need at the moment as we perceive ourselves in crisis with lots of kids not getting the beginning they ought to, we've taken a more leisurely route to the solution of the problem by looking at the general question of what is it any child, disadvantaged or advantaged, ought to have out of society in the first few years of life so he can get the best possible beginning. So we have concentrated on an examination of excellent child-rearing practices, which is kind of rare because we believe that as long as some things exist in nature that can really teach us something, we ought to have a thorough documentation of those things. And coming at the problem from that point of view and being concerned with more than with just academic competence but with what we call overall or general competence for life, we still come up with the same conclusions. What was conceived to be preventative education in at first the summer Head Start program and then the full-year program is, to us, decidely remediational, not preventative. And, in fact, even when you go down to age three, it is still remediation, not prevention; and we are drawn to the logical conclusion, which is identical with Dr. Schaefer's, that children learn from at least as far back as birth. We can get into that process and guide it rationally if we learn more, or we can allow it to proceed at random as it does now. And it is our commitment as educators to go ahead and find out how to do it rationally right from the earliest times.

I don't agree on everything that Dr. Schaefer said. For example, I don't share his optimism that at any age you can get massive developmental differences or competence or intellectual differences by virtue of intervention. My faith is still with the conclusion that there is something special about the early years, that the life history is an accumulative affair; but the evidence is not all in; and I certainly share his point of view to some degree. I do not think we should give up on people once they are beyond six years of age, but I don't agree that the same amount of effort plugged into a fifteen, twenty, twenty-five or seventy-year old is going to give commensurate returns.

Another point is that we, too, find differences emerging between fifteen and eighteen months. Almost everybody who is studying children finds that. There are a few exceptions; some find it a little earlier. But that doesn't mean what it might suggest to some people, that the first year is either unimportant or that we couldn't do a heck of a lot better than we apparently do. The work that I have done for several years on the first six months of life has suggested to me something about the topics that Dr. Schaefer went to as he tried to understand more fully what you do about language deficits. You note that he introduced the terms, relationships, social relationships and interests. In our work in the first six months of life, we think we have seen something in the way of preliminary answers to what you could do about the world which would influence the development of interests or intrinsic motivation or curiosity in the first year of life. And, of course, the business of the social surroundings that the child is always in, but, most strikingly, from three months of age or so on up, turns out in our work to be a very, very important part of what preventive or remedial education is all about.

Harland Merriam:

I have this kind of comment, if I may. I would like to get Dr. Schaefer's reaction to it. We have, on the one hand, children born to parents into homes where there are some severe language deficits. There may be some other deficits in terms of child-rearing practices. I am wondering what we are going to do about helping young people learn how to be better parents and who has the responsibility for that kind of developmental program. My own opinion is that it needs to be done in high schools and junior high schools; and, very likely, we would begin it is in the elementary school, contrary to some people who would object to this kind of educational program.

Dr. Schaefer:

I am very interested in that, and I think there are many things we could do. Is it possible that in each of our elementary schools we can have a book library and a toy library for children right from birth onward? And through their continued use, we could accumulate data on the effectiveness of each item so we could say this toy is best used for the younger child, and this one next, and this one next; and this book is the kind of book you would start with, and this one next. We could teach older siblings how these materials might be used and have them take them home and use them with their younger siblings. Or we could teach children how these things might be used and have them take them home and use them with their neighbor children or relatives. In other words, I think if there's a will there's a way to communicate something about child care and early education to children of any age right from kindergarten through high school. I think home economics has done this to some extent. I think we need to do further curriculum development along these lines; and we really need a conscious goal of training children as future parents, which I am not sure we have had in the past.

Stevens, in his book on the philosophy of education, says the schools take on those roles which they assume parents are not taking on. And I think in the past we have assumed that parents are training children as future parents. I think that assumption isn't accurate now, if it ever was, because some parents don't have the skills themselves. When there are isolated nuclear small families, older children aren't exposed to younger children; they don't learn these things in the homes, so I think the schools have a role to play in training people as future parents.

Now, I'd like to comment on Burton White's rebuttal to the emphasis on early education, as opposed to continuing education. I think it's true; yes, you can produce a more rapid gain in intelligence in a young child through intensive programs; but, if it washes out in two or three years, what good has it been? So the fact that you can change children more rapidly to a higher level if they fall back rapidly to a lower level again, in the long run, it hasn't produced any real change. So that is why I have shifted from a stress on early education to a stress on continuing education. Now, I think that I agree with him from this point of

view--all the years of one's life are important, and I don't think we ought to waste any years of a child's life. We shouldn't waste the first month of a child's life along the lines of positive growth; but I am not sure that we can say that the first year or second year is any more important than any other year; and that is why I think we need to develop a total education system that goes right from birth to death.

Dr. Blount:

I'd like to make two quick points and then have Dr. Schaefer respond to a question. The first point that he made when he was talking about Levenstein's work was that books and toys were defined as verbal interaction stimulus materials. It seems to me that virtually anything or anyone, as an individual, can be a verbal-interaction stimulus. There are many things in the homes already which we might be able to use to stimulate interaction on the part of the parent and child, as well as to "educate the child." What Dr. Schaefer related in his discussion was that the fact of his people being in the home seemed to do something all by itself. I was kind of comforted to hear that because I have believed for some time that the Hawthorn effect is a usable phenomena. To take a piece of data and say, "Well, gee, the only reason you got an increase was because you were there working with the people, and so it is not what you would call a 'true scientific finding'" is to me sort of rubbish because the Hawthorn effect obviously works and there is no reason why we can't use it.

The other comment I would like to make is the idea expressed that, perhaps, we ought to extend school down to chronological age three. I paired that with Dr. Schaefer's earlier remarks that the schools don't seem to be doing anything with the children when they get them; so all we would be doing, if education, as it now stands, didn't change, would be cutting off two years of growth potential for all the children in the country.

I would like Dr. Schaefer to respond to one point which has bothered us here at the University of South Florida as we have been thinking about early-childhood education. Okay, we believe strongly that we should go and intervene with young kids; and we should help their parents prepare their children to get the most they can out of whatever education has to offer. But, what we keep running into are the kinds of things that raise, in a sense, moral and ethical questions. And that is: how do you go about supporting and supplementing what parents are already doing without destroying what is unique to the culture which is already found in the home?

Dr. Schaefer:

I'll take your points one by one. From the point of view of verbal-interaction material, it is true that almost anything could be used as material for verbal interaction; but the interesting thing to me is how human beings need props for verbal interaction. When you meet a stranger, you start talking about the weather. This is a

conventional prop for verbal interaction. I think the toys and books, in a way, provide props for verbal interaction and may extend the scope and range of the verbal interaction between parents and children. So, if you have a toy that has color and has a number of objects, you can introduce colors and numbers with this prop, this toy, very readily. If you have a book that gives you a picture of an event, you can talk about that event even though it isn't in your living room or your home. So, in a way, I see these as props. Now, it is true, verbal interaction could go on in any situation with any kind of material; but I think that these props, these books and toys, do interest the parents, as well as the children, and do foster more verbal interaction, maybe on a wider range of topics than might naturally occur. Now, I think we should teach parents how to use their everyday experiences and everyday materials, also for verbal interaction; but I think that adding this material does help in motivating the parents as well as the children.

Now, the second point about the Hawthorn effect. I think the Hawthorn effect is important, that if people think you are trying to help them and are interested in helping them, that is important. But I think it is more than merely that. If my tutors had gone into the homes and had related excellently on a non-verbal level with both the parents and children, I wouldn't have expected verbal growth in the children. So I think you can have more focus than merely being interested in helping, and I think Levenstein's focus on verbal interaction is excellent. One of the reasons that I think that is so important is that there was a study in California by Sitkei and Meyers, (1969), in which they tested four-year-old children with twenty-two different mental tests and factor analyzed them and found six independent factors. They found the factor of verbal comprehension was the only factor that differentiated by race or by social class, and that fascinated me because it was so clear that language was the major difference between children from these different groups. And so I think it is a little more than merely the Hawthorn effect, although the Hawthorn effect is important, too, because, if the parents and children believe that you are really interested in them as people, it is a basis for going on to work with them in more precise ways.

Now, I didn't mean to suggest that schools were a negative influence on development at all. In fact, I think that the schools are an excellent influence on development; but, in a way, the schools merely educate the child at the level for which the parents prepare him. So, if the parents have prepared a child through language development in the home, through the development of interest, through the development of motivation, through the development of task-oriented behavior, through the ability to attend, to persist, to focus, to concentrate, to really work; if the parents have given the child that kind of preparation, the schools can go on and do their thing of teaching reading, writing and arithmetic and the other academic subjects. But, it would appear that the schools are not teaching those basic prerequisite skills which the child needs to achieve in the classroom. So I wouldn't say the schools are a negative influence. Just one more comment on that. I think for a lower-class child whose home is not a stimulating environment, the schools would be a better

environment than his current home situation. But I think for a middle-class child, in a home in which the mother is very interested in interacting with the child, the home may be a better educational environment for that child than the school, which relates to the fact that they have found that Head Start is most effective with the most deprived children from rural, very poor families. So I would say differences in intellectual level are produced by differences in environment; and, if coming to a school produces a better environment for a child than his home would be, I think his level of functioning is going to increase.

Now, the moral and ethical question about whether we are changing the unique culture of the child is a very complex one which we probably can't discuss fully here. But I do think that we are in a technological society that requires certain skills in order to get the incomes and the jobs and the kind of education that most people seem to want. The poor seem to want education; the poor seem to want good jobs; the poor seem to want good incomes. The question then is what kind of skills do you need to function in our educational and occupational situations? And I think that these early-education programs are designed to give the kind of skills that these children need to function in this technological society of ours. I am impressed that more and more the skills that are needed in middle-class occupations are skills in relating to other people and skills in communicating knowledge in one fashion or another, and so I think these programs are designed to foster that. I hope we will also encourage the unique values of the home and the culture that the child has, but I don't think we are destroying those values by teaching skills that a child needs to function successfully in the broader social context.

Questions from the Audience.

Question:

Since the conference got off to a rather late start, I suspect that perhaps Dr. Schaefer has some other stimulating ideas that he might have planned to present to us that time didn't permit him to make. Are there any other areas that you would like to inform us about that you didn't have the opportunity to?

Dr. Schaefer:

Fortunately, the discussion period gave me time to talk about one of them, really thinking of children as future parents and trying to develop the skills in them that they are going to need as future parents. This relates to the idea that teachers should see themselves as leaders of the educational team rather than merely the people who educate the children. Because, if teachers would teach children effective methods as future parents and also teach them to teach one another and to teach younger children, I think, eventually, they might be much more successful. Now, have these methods been worked out? I am not at all sure that we really know how to do this very effectively. But I am saying, if we have this as a goal and start putting men working at it and put some money into it, we can develop these methods.

I believe, as I have said already, that we equate schooling and learning too much. The school room has a very important part in education; but, unfortunately, at this point, it only starts at five or six for most children; and even if we extend it down to three, it wouldn't be touching many children early enough--and it only touches the child in the school room during the time he is in the school, while outside of the school room, he is relating to TV and the community and the family. If we really extended our concept of learning to learning in the total environment, I think it would be extremely important; and I would appeal to educators that they start developing programs along this line and really put some manpower into this proposition. I think, for one thing, that we all have to train our future teachers differently. I have been asking various schools whether they have any courses which teach teachers to relate to this whole extra academic education system. And I haven't found one yet. I hope it exists somewhere. So I can see that you might develop a course for teachers on the extra academic education system. Or you might develop a course for teachers on the family as an educational institution and what we might do about it. And we might develop a course for teachers on how they should be relating to the family and to the community in achieving their educational objectives. So I think there are many things to be done, and I hope some of them are going to happen in institutions that are training future teachers.

Question:

Would you care to comment on Dr. Jensen's findings in his study of how much can we boost IQ as compared with your studies on early intervention and increases in IQ?

Dr. Schaefer:

I think that Dr. Jensen has looked at part of the evidence in the field, not all of it. And I would just like to cite one example. In his article he states that the IQs of adopted children correlate more highly with those of their natural parents than they do with their adoptive parents, implying that genetics determine a child's functioning level, rather than the environment. But what he neglects about those same studies from which that data came is the fact that in at least one study, the natural parents had a mean IQ of about 90, while the adoptive children had a mean IQ of above 110. In other words, there was a shift in IQ level of over twenty points from the parent level to the adoptive children's level. Further along these lines, Skeels and Harms, (1948), report that they followed some adoptive children whose mothers had been mentally retarded with IQs below 75; and the mean IQ of that group of children was 105. This means that, if their mothers were below 75 and the mean IQ of their children was 105, that was a thirty-point jump above the level of their parents. I think that this very large shift was developed by this total educational atmosphere that the child came into in his adoptive home. Obviously, these adoptive parents were interested in children and were probably stimulating them so there was a tremendous gap between the parent generation and the child generation. Now, Dr. Jensen doesn't look at this kind of evidence; and I don't think

he has the kind of focus on the total educational process that has been developed in the field of early education and psychology. He's far more focused on the genetic evidence; and I don't deny that there are genetic limits to anyone's potential; but I would say that the potential of poor children has not been developed; and we will never know what the intellectual potential of these groups are until we have equal opportunity for growth and equal stimulation for all children. Then we may know whether there are genetic influences and how much. So I disagree with the major thrust of Dr. Jensen's article, and I think that he has only looked at part of the evidence.

Question:

In your project, you said that the control mothers were doing a better job in the end than the mothers of the experimental children. If we are advocating early childhood intervention in order to make the family a change agent, it would seem to me that this is in direct opposition to what we're advocating. Point number two: I'd like to talk about sex. I run a school for exceptional children in which we have about 450 children, and I would say somewhere around 400 of those are boys. And about the only word I have heard mentioned with reference to parents is "mother," and I would think that the father would have some role to play and would like to hear your comments on that?

Dr. Schaefer:

On the point that we found that some of the control mothers were taking more responsibility and showing more initiative in the education of their children than our experimental mothers, you must remember that these are anecdotes; and they may not be supported by hard data. But, I think the point that I was trying to make is this: that we went in, and we had a child-centered tutoring program in which the tutor went in and educated the child herself. We were, of course, encouraging the mother somewhat to relate to this process. In contrast, Levenstein went in with a very clear focus on teaching the mother the skills she needed to educate her child. Now, it seems to me that those are two completely different programs. Ours was child-centered. In a way, it was saying implicitly to the mother, "We have the skills and the confidence and the adequacy to educate your child, and we're going to take responsibility for him by coming in and teaching him." While Levenstein's program was saying to mothers, "You can have the skills and the confidence and the adequacy to educate your child, and we're going to help you develop those skills; but the responsibility is yours." I think that is a critical difference. I think it should always be clear that the responsibility is the parents. That is why I am a little alarmed at the plans for massive day-care programs. If we encourage mothers to come drop the children early in the morning and pick them up late at night, implicitly, I think we are saying to the mother we will take the responsibility for the development of your children. I think, in the long run, that would be very disastrous because the family is the only source of early and continuing stimulation for the child. Betty Caldwell's, (1967), day-care program, I think, is an example of this. She had great gains in her children while they were

in her day-care program because they were stimulating very intensively there; but a year out of the program, the children dropped back quite significantly. So I think, if we had the objective of increasing the parents and future parents' sense of confidence and adequacy and responsibility for the care of their children, we'd be helping build up the family because I don't think society in the schools or child-care institutions outside of the family can take complete responsibility for rearing children.

As for fathers, I agree with you completely. I think this is a trap we all fall into, developmental psychologists because they've largely studied mothers, educators because they largely relate to mothers. And I think, in teaching future parents in the schools, one of our major objectives would be to interest those future fathers in child care and education. I think, more and more, our whole society is moving toward education and human services as an occupation. And we ought to teach males to relate to those occupations, too. You know, I am very much in sympathy with the women's liberation movement when they say there should be more equalitarian sharing of roles in the family, and I would add, particularly in the area of child care and education. There was a study someone did with one of my methods in which an attempt was made to obtain children's perceptions of parents' behavior. The result that fascinated me was the way the maximally alienated high school student described his mother as being hostile and over involved, and his father as hostile, very distant, ignoring, neglecting and detached. So maybe if we could get a little more balance in these roles so we could get the father to relate more heavily to the children and to allow the mother to develop more interests outside the home, we would have some good results in all directions.

Question:

I wondered if you could give us some examples of some of the kinds of things that were taught the students, especially with regard to the remedial teachings, and also how effective you feel the Montessori method is in teaching in the home.

Dr. Schaefer:

As I have said, the first goal of our tutors was to develop a relationship; and anyone who has been a mother knows how you develop a relationship with a young child. You try to provide some interesting activity; you try to present yourself as a loving, caring, non-threatening person; and you build up the relationship. So really, that was the first step in our program. And then we introduced toys, very simple toys, popbeads initially. There you have colors and shapes, and you can separate them and join them and such. Some of this has been described in a little publication that the Office of Education put out in which they have abstracted some of the essays of the tutors; and they list some of the books and materials used by the tutors, so I can tell you, perhaps, where you can get that reference. But I think many middle-class mothers already have these methods, but it is interesting that they really can't verbalize them very well or communicate about

them because I think this culture of child rearing and child education is sort of an implicit method which has not been communicated well as yet. What we've got to do is really learn these methods, develop them further and then communicate them to all parents and future parents and child-care workers.

Final Comments by Dr. Carl Haywood:

I hear Dr. Schaefer calling for, not a revolution within education, but really a social revolution that changes the concept of the responsibility for education. It seems to me that in many respects we have assigned children to school as a way of getting rid of them in the same way that we frequently get rid of retarded children by dumping them into an institution and then abdicating our further responsibilities or assuming that we have fulfilled them. I am delighted with the emphasis on the further involvement of resources that are currently quite outside the formal educational system. The incorporation of the family structure into the educational process, or more properly, the incorporation of educational processes into the formal family structure is a most exciting idea.

One thing that has occurred to me that has retarded the above process has been the growth of professionalism in education. Let me give you an analogy that I hope will soften that blow a bit by demonstrating to you that I acknowledge that the same sins have occurred in psychology, which happens to be my discipline.

For the largest number of years in our existence as a scientific discipline and as a helping profession, we have insisted that we were the only ones who could do certain kinds of operations. For example, give intelligence tests. We did two things by insisting on that kind of professionalism. One, we severely limited the number of individuals who could take advantage of those "professional services" because, in spite of the burgeoning graduate schools, there are simply not that many psychologists around. The second thing we did was to chain ourselves to the Stanford-Binet kit so that we spent a large number of years doing something that we recently found out almost anybody can do, at least as well, and keeping ourselves from doing the things we should have been doing that would have taken more advantage of our particular specialized training. I submit that the same kind of thing is true of teachers, particularly public school teachers, that they've chained themselves to the lesson plan, to the classroom interaction kind of thing which we have just recently begun to learn is something almost anybody can do. When we have finally gotten the courage to utilize classroom assistants, teacher-aides, many of whom are citizens who are indigenous to the particular community structure in which the school finds itself, we have learned that such individuals are quite competent to do many of the things that professional educators have insisted that you have to have a credential to do; and what we have done in the meantime is to keep teachers from having time left over from that to spend innovating in the educational process.

Let me go from that to the question that came up, not in Dr. Schaefer's principal presentation, but later, that is that the emphasis

when we do get into the family, is on mother-child interactions. I don't think there is much point in trying to track down why that has been so. I have some suspicions. I think it may be a holdover from early psychoanalytic concerns. But I keep wondering, as do some of you, whatever happened to fathers. Well, one thing that has happened to fathers presents us with an interesting kind of hypothesis; that is, in the lowest socio-economic levels in our society, we find adult males absent in the home. So what's happened to fathers is that they are not around. Why aren't they around? In some cases they aren't around because the structure of the welfare system chases them off and says, "If the old man shows up, we are going to cut off the aid to dependent children." And so the only time the father can come around without seriously impairing the economic status of the family is in the middle of the night when the social worker is not likely to show up.

The hypothesis that this suggests to me is that one of the differences between middle-class and low-socio-economic-class groups is that in the middle-class family some adult male is usually present; and in the lower-class group, some adult male is usually not present; and, in fact, we have what Susan Gray and others refer to as a polymatrix situation in which you may have three or four mothers, the mother, her mother, her sister, and so on, running the household. Now, is it possible that one of the sources of intellectual performance educational deficit in lower-class groups is father absence? And, is it possible that, if we instituted procedures in the form of restructuring the welfare system, for example, that would result in maintaining the adult male within the family structure and within the home that, that itself would constitute an intervention treatment sufficient to overcome some of the performance deficits in education observed in inner-city, lower-class groups. Well, it makes for some speculation.

Another point that came up, not in the main presentation of Dr. Schaefer, but later, was the use of correlational methods in the study of the effects of genetic and environmental influences on the growth of intelligence. And I would like to make just one further comment on that. I think that Dr. Schaefer responded quite appropriately to that. I think that one has to be exceedingly cautious in interpreting correlational data. I would like to point out to you that these correlational statistics reveal nothing about the intellectual levels of the two groups of scores being compared. Correlations are concerned chiefly with the rank ordering of two groups on a common characteristic. Now, I recently prepared, together with Don Stedman, a staff position paper for the President's Committee on Mental Retardation entitled "Poverty and Mental Retardation" in which we discussed this point. If you'll forgive me, I'd like to read for just half a minute.

> "It would be possible to design a study in which 100 pairs of identical twins were divided into two equal groups consisting of one twin from each pair. One group would be reared in educationally-optimal circumstances, Group A, while the other group would be reared in educationally-deprived circumstances, Group B. The average IQ in the two groups initially would be almost exactly the same, allowing a small difference, due to error of measurement, because each member of Group A would have an

identical twin in Group B; and the correlation in IQ scores between Groups A and B would be nearly perfect. Let us assume that educational advantages given to Group A had a uniform effect, for example, raised every individual's IQ by twenty points and that the educational deprivation in Group B lowered each individual's IQ by ten points. At the end of the study, the mean IQ in Group A would be thirty points higher than the mean IQ in Group B; but the correlation between the two groups would be exactly the same as it was at the beginning of the study, that is, nearly perfect. Thus, one must look for mean differences as well as for correlations when comparing ability under different conditions. And I think it is reasonably fair to say that those who place more emphasis on genetic contributions to the growth of intelligence relative to the environmentalists use chiefly correlational methods to support their arguments, while those who take a more dynamic, a more evolving, growing, developmental point of view on the growth of intelligence, tend to compare the mean score of groups rather than their correlation.

I think that the emphasis on language learning is quite appropriately placed. I'm quite certain that we are going to hear some more about the business of learning language through emphasis on its formal structure from Dr. Bereiter, so I won't try to anticipate his remarks. Just say that while language learning does have its initial spurt in growth between one and three years of age, language learning certainly continues well past that age.

I was impressed recently with a visit to the home of one of my doctoral students whose wife spent the first eight years of her life in a completely Spanish-speaking home and then abruptly changed to a completely English-speaking environment. She still speaks Spanish, but she tells me that her Spanish is the Spanish of an eight-year old. So when she goes to communicate with entirely Spanish-speaking persons, they think she is kind of dull.

I am also very excited with Dr. Schaefer's idea of creating what a recent contributor to the American Journal of Mental Deficiency has called therapeutic pyramids. The analogy in an institution for the mentally retarded is within the operant behavior paradigm. This person has taught high-level retardates how to go about the business of behavior modification using the conditions and principles of operant conditioning. Then each of those individuals trains others until you have a pyramidal effect with much spreading out of the teaching process, beginning with the psychologist who first taught one of her assistants, who then taught the retarded child assigned to that laboratory, who then worked on the wards and taught the children with whom she was working. It is kind of the old strategy for overcoming population illiteracy. It is the each one teach one, except each one

teaches more than one. The thing that happened recently that got me excited again about that kind of notion is that I sat on the doctoral committee of a student at Peabody who was getting a Ph.D. in Music Education; and this young lady happened to be Swedish; and so her dissertation had to do with materials for music education in Sweden. She had translated a music education book. One of the things that she brought out in her doctoral examination was that free textbooks really do mean free textbooks throughout much of the Swedish educational system. We don't mean it. We lend textbooks; and then we take them back; and we get a little nervous when the children take them home; but they certainly can't be taken home over the summer. They have to be checked in very carefully, and somebody looks for pencil marks and that sort of thing. Well, I was impressed with the practice of giving the books to the children. In music classes, they had given the books to the children and had observed that younger siblings of children who had received music books would frequently show up in school next year with the books that had been given to them by their older siblings, already knowing what was in them, knowing the songs and some of them knowing how to read the notes. So it may be very useful to extend that kind of notion and begin to mean it when we say that we are providing free textbook materials.

ENVIRONMENTAL CHANGES NEEDED FOR OPTIMAL CHILD DEVELOPMENT

Presentation Made at Session II, Thursday Afternoon.

Chairman: Dr. Jo Long, Assistant Professor, Early Childhood Education

Speaker: Dr. Burton L. White

Let me start by making some introductory remarks. One thing is that I am very sorry to have to follow Earl Schaefer's presentation this morning because I used to sing when I was younger, and the principles of show business tell me that I am in tough shape before I start. Secondly, I don't have the answer to the question of the environmental changes needed for optimal development, although that problem is what I have devoted my career to. If our society could find real answers to such a question; and, if we had the commitment to do something about implementing those answers as a society, what a wonderful world it might be. But I'll try to tell you what I think I know at this point.

In my research, I have never been in compensatory education, per se. That is not the way that I got into the business, nor is that where I am headed. I have always been interested in the roots or the origins of human competence. What are they? And where do they come from? We do intervention studies the way anybody with a scientific orientation tries to use the experimental method to determine whether he has learned something or that he is kidding himself. We do intervention studies, but usually only after an awfully long lead-in time. So, for example, in our studies of zero to six years, right now, which have zeroed in on the one to three age range, it will be approximately a minimum of six years from the time of the first efforts at cracking the problem to the time when we have sufficient data to start an experimental intervention program. How we funded this work at the rate of $100,000 or so a year is another interesting story in this day and age, but I won't go into it.

Now, what I am going to talk to you about today falls naturally into two categories. First, there is the question of human development in the first six months of life. I spent ten years on that problem; I'm still not quite out of it. It has two phases. First, is a detailed examination of the development of adaptive abilities during that time. What does the child gain in the way of mastery abilities in the first six months. Second, is the examination of the role of the physical circumstances surrounding the child, particularly in the crib, in the development of those particular abilities. The second part of my presentation has to do with the last four and a half years where we have studied the development of human excellence in the first six years of life. This work has consisted of the following parts: one, the determination of what we mean by optimal development at six; two, the tracking of the etiology of optimal development during the period of zero to six-- what does it look like earlier than six?; and, thirdly, a study of the role of experience in the development of human excellence during the naturally occurring first indications of developmental divergence. Now, what I mean by naturally occurring indications of

developmental divergence is that, if you will look at American society, you find, from the evidence that we have of the development of abilities, that there are enormous differences in any group of a thousand children at age six. Everybody knows that. There are big differences at three; and Dr. Schaefer cited some international studies which support that view; but, by and large, we don't find such differences routinely at the age of one year. We see them emerging at the fifteen to eighteen-month period.

Figure 1

I have a slide that I am going to finish building to set the background for what I am doing. I hope you will forgive me for using the vague term "development of abilities." Let's, for the moment, just think in terms of a generally competent human being. He'll score well on an IQ test, but he is much more capable than that. Now, it seems to me that you can characterize the over-all development of competence in the first six years of life by drawing a curve that looks like Curve B in Figure 1. That Curve indicates the general principle that most of us accept, that the rate of development is rapid at the beginning of life and declines subsequently, though there is significant development going on throughout the pre-school years. We characterize that kind of development as "B" or average development. That is an arbitrary designation. Now, we are all aware of the fact that you will find major differences in competence at six if you take any random large group of kids and that, in addition, you have fairly substantial differences at three. But at one, there are no big differences. Now, I think you can summarize what we have been talking about and some of the things I'll say by drawing the curves for optimal (A) and poor (C) development between one and three to indicate that a (C) child begins to drop behind sometime during his second year; and then, though he gains in ability from one to three, he is not making an awful lot of progress. Also, between one and three, the child who is really making it (the A child) is considerably advanced at three and continues to gain between three and six. Now, how much he continues to gain is an interesting topic in its own right. The standard finding, if you'll look at what all forms of nursery schools do for a talented child, is that nursery schools don't seem to do a great deal. That's an interesting question for early education. Now, getting back to the first year of life, there is no indication currently that whatever the average family is doing for its child at this point in history is making for enormous developmental differences. Now, you could assume that we don't have to worry about zero to one, that the first year is not important. The work that I have done on the first six months of life has convinced me otherwise. It has convinced me that, given an intelligent understanding of curriculum topics in the first six months of life and given the opportunity for good execution, which, by the way, is one of the hallmarks of the best compensatory education programs, you can get developmental acceleration during the first six months in a variety of areas. Furthermore, regardless of what Dr. Jensen says, until we have the kind of continuing education Dr. Schaefer talks about, i.e., a continuous redesign of curriculum as the child makes progress month after month throughout the bulk of the developmental years, we will never know the limits of environmental impact on development.

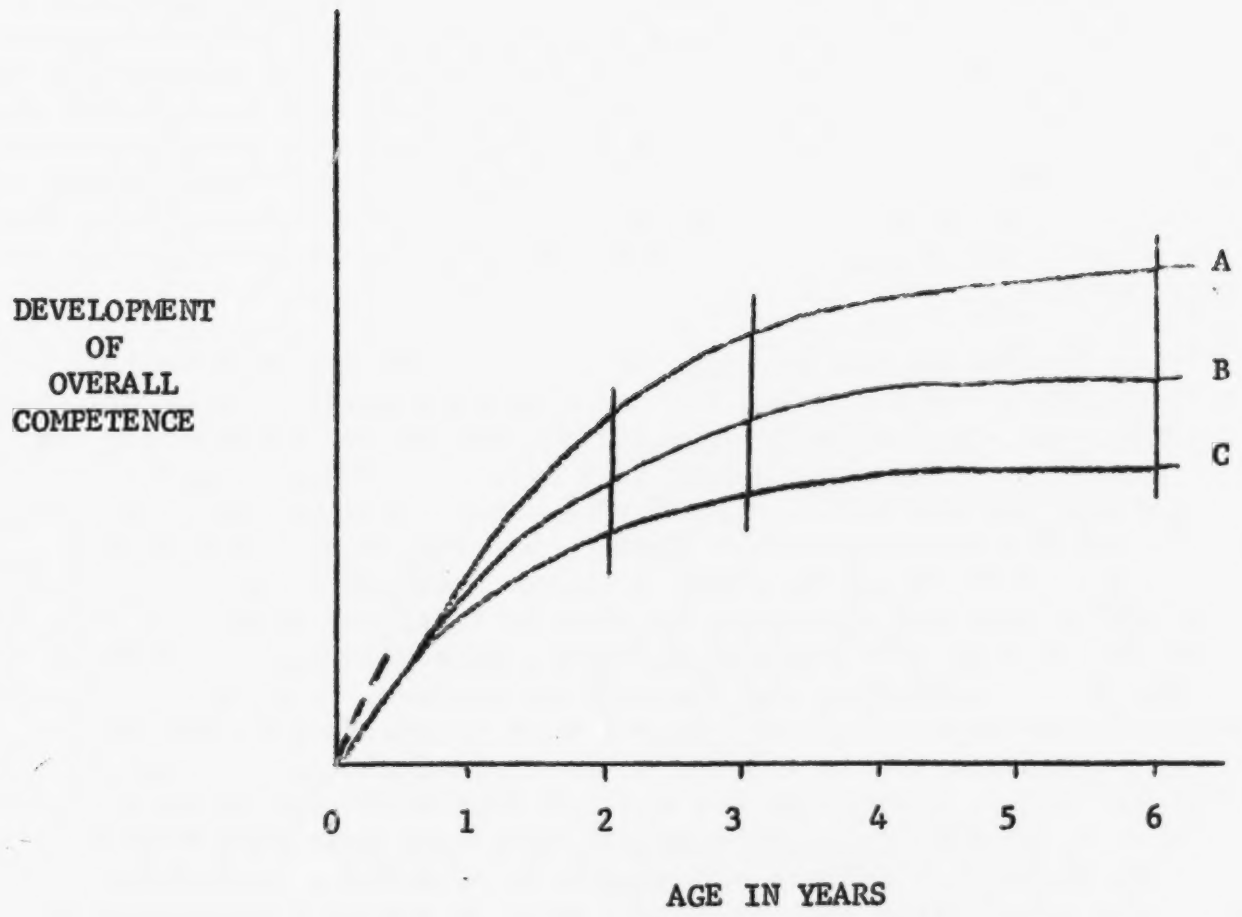


Figure 1 (White). The growth of human competence (speculative).

Now, let me turn to the adaptive abilities of the first six months of life. There are quite a number; but the ones that I have worked on, which, I think, constitute many of the major ones, have to do with sensory motor explorations, the kinds of things that Piaget talked about in building his theory of the precursors of mature intelligence. They involve the child's tendency to explore his world visually by looking around and studying things. They involve his visual discovery and consequent studying of his own hand. They involve his acquisition of that very important tool, the use of the hand under the guidance of vision; the ability to reach out (which he doesn't have at birth) and then bring things to himself to either examine or bite or God knows what; the development of the abilities that allow us to see clearly, like focusing ability called visual accommodation, the things that an automatically-focused camera does for itself but a new-born baby does not; the development of the blink response as objects approach; and the development of sensory-motor intelligence. These are the things that I have worked on. There are a few others. There is the development of the convergence of the eyes when objects come close to the eyes. There are developments in the area of the attachment to a human being that are revealed by the first smiles of the second and third month of life. Those I haven't studied directly in this age range.

The environmental factors that we have studied and that we have manipulated are those involving the sensory-motor activities of the baby. For example, we have routinely provided for babies the opportunity for head-rearing experiences by placing them simply on their stomachs for comparatively long periods of time during these first months of life. We have provided the opportunity for them to bat out, reach, and fondle interesting objects by making them available where they can best see them and where they are likely to be able to reach for them. We have also, in the case of the hospital children, made rotational movements more possible by flattening out the crib mattresses. For visual activity, we have made the hand of the new-born baby a better target than nature made it. We provide little red and white striped mitts. We were inspired to do this, partly, because we had noticed that black babies seem to discover their hands earlier. Other people have said that such precocity is probably because black infants are generally advanced motorically, but there is the possibility that the black hand is simply a better target. We have provided stabiles, which feature all sorts of interesting objects, over the child, geared to his particular interests and capacities, which are growing rapidly in the early months. We have provided printed sheets, rather than white ones, and a view of the hospital ward by opening up the crib liner at the foot of the crib and placing the child on his stomach so that he can see out. The child, from two or three weeks on, will increasingly come to rear his head and to look around. We have given him something to look at when he does that. Now, what does that look like? Well, I think we can see what happens with the help of slides and film. Let's see the first slide, please.*

*Burton L. White. Child development research: An edifice without a foundation. Merrill-Palmer Quarterly of Behavior and Development, 1969, 15, p. 63.

This is a plot of how much time the child is really exploring his environment in the first four months of life; and, in spite of all you may have read about how talented the newborn is, he is mostly asleep. Maybe when he is awake and alert and in a laboratory you tickle his underarms and the soles of his feet, he will do some things for you; but, by and large, in most of the homes of America, babies are sleeping almost all the time in the first week of life. In fact, they don't really seem to get over the experience of being born, which is a fairly rough one, until they get to be about four or five weeks of age. That fact is not new. Gesell, in the old days, Piaget and others have noted this. But what you see there is that there is an enormous growth in alertness sometime toward the end of the second month of life. You also see a kind of leveling off during the third month and then a decrease at three and a half months and then a striking increase in alertness again toward the fourth month of life. By the way, this is based on watching hundreds of babies three hours a week. Forty-nine days happens to be the time when these children typically discover their hand visually. Prior to that age, the hand passes through the line of sight; but they don't notice it. But at 49 days or so, this group typically discovered their hands and then began to spend enormous amounts of time staring at the hands, first, fisted and then with the fingers open. Now, the question I asked myself was: "Is it coincidence that the hands are discovered at about this time and visual alertness rises dramatically, or is there some possible relationship between something interesting to see and the amount of time babies spend looking? Subsequently, in the next few weeks, they've got nothing else to do but look at that hand in the world we're talking about; and you see that nothing much seems to happen in this curve until three and a half months when there may be a fatigue or boredom effect. Then, just before four months, these children were shifted to bigger cribs with open sides; and they were also able for the first time, to turn their torsi to the right and to the left. Those things combined gave the child a new visible environment. He could look at the child next to him and to the nurses going by; and again, we have a steep rise in visual attention. Now, clearly, I doubt that there is any invariant relationship between things available to do and alertness. But I would expect that there is probably at least some relationship between the two factors.

Let's have the first part of the film clip just to show the circumstances they were living under. This is the nursery ward. It has thirteen-foot ceilings. There's nothing much on them. Here are the cribs or bassinets the children live in from birth to about three and a half or four months of age. This is a two-month-old baby. You will notice that the hands are mostly fisted. Okay, hold the film. Now, let's go back to another slide and see what we've got. (Slide 1 illustrates infant hand-regard behavior.)

This is the behavior of hand-regard that you see in your own child, interestingly mostly in the fourth month of life, from three to four months. These children you see beginning in earnest just before the third month starts, and the reason for that seems likely to be that they've got nothing else to do. Your child is carried around a lot and has other things to look at. Infants are excellent students. If you watch children doing this sort of thing, you get the strong feeling that

they're working hard at learning something. It would seem to an adult that there isn't much to learn because they are just staring at the hand or the hand moving or the fingers.

Next slide, please. (Illustrates infant in tonic neck reflex position.) This is the tonic neck reflex posture commonly seen in the one to two month old child and dropping out at about three months. It's important to consider if you want to design the physical world of your child, and we might want to do that in the near future. Hanging things directly overhead for the one month old child is not very good for at least two reasons: one, he doesn't look directly overhead very much; and, two, he is mostly sleeping. But, certainly, in the period when he is awake, the better place to provide things for him to look at and to touch and to bat is off to the side; and you'll see how we did that a little bit later.

Next slide, please. (Apparatus for assessing visually-directed reaching.) This is an object that we use to assess the course of development or visually-directed reaching. We present this object to children either overhead or on either side once a week from the time they are something like four weeks or five weeks of age up until they are all reaching, and for several weeks thereafter.

Next slide, please. (Illustrates infant-swiping behavior.) The two-month old child in this group, routinely, when presented this object, would take a good look at it and very often, accurately, bat it. This suggests an evocative quality of a certain kind of element of a physical environment. Put something there--they won't be bored all the time. They'll be doing something with it.

Next slide, please. (Illustrates unilateral hand-raising behavior.) This is just one of the other behaviors that emerges. After that batting or swiping behavior, you see them in the next phase in a week or two merely raising the hand up near the object and then looking back and forth as if they were, somehow, trying to figure out why this thing that's out there doesn't look like what they usually see and why are there two? God only knows what is in the infant's mind.

Next slide, please. (Infant with both hands raised.) Here is an indication of the child getting to be about three months of age. Both hands are brought into the act, and the fingers are usually more outstretched than the younger child. That's important, too. If you're interested in tactual development in the first two months of life, you're in trouble because the child's hand is typically fisted; and it is not an easy thing to get him to explore things with his fingertips. He will explore tactually with his fingers at three months and four months. That is one reason why a rattle is an incredibly bad toy for an infant. During the first weeks of life, you have to pry open his fingers to get it into his hand; and, in the course of his ordinary movements, it drops out; and he has no hope of ever getting it again unless he is at least five, six or seven months of age. So it requires that the mother or some other human being be standing there, re-inserting it over and over again. It doesn't work.

Next slide, please. (Infant with both hands to the midline and clasped.) You can't see this very well. It is hands clasped at the midline, a favorite activity of three and a half month old children. No matter where the object is presented, he brings up his hands in this position. This can be understood partially, at least, in Piaget's system as a kind of sign of recognition. He is trying out the behaviors that he is familiar with on something interesting and new. But we won't get into that.

Next slide, please. (Infant with hands to midline, clasped and oriented toward object.) This is the next level where the hands are not only brought together but actually brought over toward the objects.

Next slide, please. (Illustrates Piaget-type reach.) This is a poor representation of real reaching which is similar to what you and I do. Just before we contact something, we, generally, tend to adjust the fingers in anticipation of contact; and you see such behavior in home-reared babies between five and six months and in the institutional babies, control babies, again at five months of age. So you might ask: "Are they deprived?" And the answer is in a gross sense, "No." But the answer seems to be that institutionally-reared infants get the first step of the process, finding the hand, sooner because there is nothing else to do. But then it takes much longer to learn to do something with it because there is nothing to work with. They have no curriculum materials.

Next slide, please. (Illustrates retinoscope apparatus.) This is the gadget we use to determine how well they focus on a visible target or object. It is an adaptation of an optometrist's retinoscope. It produces a special kind of light which, when bounced back from your eye, tells the optometrist how accurately in depth you are looking. Now, I won't go through the long story, but it turns out that you can use this technique on babies if you get the compelling influence of the examiner's head and hairline and eyes out of the way. That is why we have that white screen there. Secondly, if they do not continue to look steadily at that source of light in the middle of that circle, we have a little motor behind the screen; and we can flick a switch so that the tinsel flicks around; and the movement re-interests the child. Movement and soft noise are very big attention getters in the first six months of life.

Next slide, please. Well, this kind of technical-looking slide shows you what the growth of focusing ability looks like.* The important characteristic here is the slope of the line. If it is at 45 degrees, your child, essentially, has no capacity to adjust his eyes for changes in the distance of what he is looking at. In the first month of life, the child, when alert, will have clear focus at anywhere from five to ten inches, typically about eight or nine inches. He won't have a single image, mind you, because his eyes don't converge as yet. But he'll

*White, p. 65

have clear focus with the dominant eye at that distance; and, if an object moves closer or farther away, it gets badly blurred right away. The second month, you see the line starting to flatten down showing increased flexibility.

Next slide, please. You'll see how, by three and a half months or so, the child is performing perfectly; and, in fact, after three and a half months, curriculum designed to feed vision can be applied at almost any distance within the normal range; and the child can cope with them as far as focusing is concerned. Now remember, it is possible for him to be focusing clearly and not see well; however, you need more than just the focusing mechanism to see well. But if you can't focus, no matter how good the rest of the visual system is, you can't see either.

Next slide, please* We plotted the development of the growth of visual attention, of visually-directed reaching, of hand regard, of focusing ability and a few other things. We then said: "Are these things necessarily going to emerge at some pre-ordained rate? Or does what happens to the child make a difference? Are rearing conditions and experiences important?" The first study we ran, because of many findings from animal work, was to rock and handle the children in the first month of life. These hospital children typically only see human beings every four hours for very brief feedings. They get a brief sponge bath in the morning, and that's it. They only get their diapers changed at feeding times. We gave twenty extra minutes of handling a day, starting on day six, to a group of ten babies and kept that up for thirty days to see whether giving them more contact, not so much because of the human quality but because of the opportunity to stimulate their feeling receptors, which are presumably maturationally ready for that kind of experience, would have any miraculously positive results in the next couple of months as it seemed to have with mice, Siamese cats, certain kinds of dogs and, possibly, with monkeys. In fact, no clear effects were found, except for a slight tendency to be a little more alert in the second and third months of life. And that is all that slide is supposed to tell you.

The next study was an attempt at broad-based curriculum. We applied ideas about early perceptual development coming from people like Richard Held at M.I.T., Austin Riesen in Chicago and others. We provided interesting things for them to look at and to interact with motorically. We were guided additionally by what they were capable of doing. We designed another physical environment for these children, and it is shown in the next film section.

That top piece is just a backboard for contrast, and we have objects sprinkled throughout the accommodative range to induce flexibility in focus. That red ring is a mirror frame, and these objects are positioned near where children will work. Now, this child is only two months

*White, p. 67

and a week old. This child is not bored; she is engaged. She is having a good time. At about three and a half months, they start to go euphoric in this sort of situation--they giggle at the mirror; they shriek; they destroy the toys within their reach. And it's great fun for the staff because the ordinary institutional ward is a very quiet place at three and four and five months. Here is another child at about the same age. Notice he is looking to the left, and he is working on the right object, too. Now, he's looking in the mirror. Okay, film off.

The question is: "What happens to the course of development of children in the first four or five months of life when they live in that world, as opposed to the standard world of the hospital?" And the answer is that lots of things happen. The first thing that we found was that, somewhat to our dismay, in the second month of life, living with all that stuff overhead seemed to be somewhat unpleasant for the children. They tended to be a little upset by it, and they tended to be less visually attentive than the control babies. This is the development of reaching behavior in the control groups showing that they started to swipe at objects at about two months and that they were reaching for objects at about five months.

Here's what happened to visual exploratory behavior.* The control group is the solid line; the handled group is the dash line; the latest group, reared with handling and then what we called massive enrichment in the next three months is the short dashes and long dashes. There was an initial expression of this function in the first month and a half of this experience and then a turn around at two and a half months or so. We use this slide as evidence for the obvious influence of rather simple changes in the physical circumstances on some fairly basic kinds of processes. These infants were fairly late in discovering their hands.

Now, concurrent with that lateness in discovery of the hands, we found that the swiping of objects was retarded a bit. I don't remember whether it was significant or not, but it was certainly later. Once the babies start interacting with the materials, they take off quickly in the area of visually-directed reaching; and, by three months and seven days, they are reaching. In other words, once they got started, it only took them a month to master the skill. There is some question of how significant that sort of advancement is. I don't really know. I do know that it is hard to ignore the size of the advance. A little less than two months in the life of a five month old child is an enormous difference time wise. Secondly, there are theoretical reasons to believe that reaching is potentially a very good instructional tool for the young infant. Now, if we could capitalize on this earlier acquisition of the tool, we might be able to provide a more interesting and informative existence in the following months. There are other reasons to think the advanced acquisition of reaching might be significant; but, of course, without more work, you can't say for sure.

*White, p. 73

Slide off, please.

We modified our curriculum; and, in the second month, we only provided circumstances around the child that were well within his developing capacities. You'll see them in the next film section. This third group, called the modified enrichment group, was handled during the first month and then given this new situation during the second month and then given massive enrichment. These objects, as you can see, are placed on the side. That's because the head position of the one to two month old child is typically off to the side. They are about seven inches away, which is a good distance for focusing and a distance where, in a tonic neck reflex position, the hand on one side that the child is looking at is likely to bat into something you put out there. This child is less than two months of age, and he is definitely working.

Here's a child about two and a half months of age illustrating the reaching behavior, which we really shouldn't expect out of a child until five months or so. He reaches. Film off.

Next slide, please.* Here's what happened to visual exploratory tendencies in this later group. The curve, which is dashes and dots, is this last group; and they are the most consistently attentive group that we have had. They discover their hands earlier than all the rest--forty-five days in that group.

Next slide, please. This slide**shows what happens with reaching behavior. This group is represented by the lowest of the three curves. They swipe earliest of all, and they are reaching at slightly less than three months of age. They are the most consistently precocious group. So we think we have a pretty good curriculum for these kinds of behaviors. That doesn't mean that it is the best one, but it is better than the previous ones we have had.

Next slide, please. (Illustrates infant in mitt study, fourth modification of rearing conditions.) This next slide represents the final study we did. The babies were being adopted or placed in foster homes at decreasingly younger ages, so we tried to do something about the acquisition of flexible accommodation in the blink response and hand regard, which are the behaviors that come in, in the first two months of life. These children were given mitts, which make the hand more perceivable, placed on their stomachs and given interesting things to look at in the crib, in the form of these patterns.

*White, p. 75
**White, p. 74

Next slide, please.* This is what happens. This slide is used to illustrate the rather striking flexibility or plasticity of the time at which the child discovers his hands. That date can range from anything as low as less than forty days of age, as was the case with the mitt group, all the way to at least sixty days. In fact, it is a normal thing, according to the Gesell schedules, for children to discover their hands at ninety days. One of Piaget's children didn't discover her hands until 120 days. So this is an extraordinarily flexible landmark of early development.

Next slide, please.** This shows that, with this last enrichment study, we didn't really alter, significantly, the sheer amount of exploration of the environment.

The next slide***says that what they do when they're alert was shifted so that in the second month of life these children did a lot of hand regard, whereas the control children did none.

Slide off, please.

Now, there are two reasons why I have spent so much time today on the first six months of life. One reason is that the rest of the program doesn't generally deal with that age range; and, although as a society, we may not yet perceive that age as educationally important, I think, if we're going to think in the long haul about early education and being professional about it, we, at least, have to keep our minds open to some possibilities of doing better than we are currently doing. The other reason is that there is a good deal of information that you can't really get across in any lesser amount of time.

Let's go on now to talk about the older child. As I said at the beginning, we came to a study of the young child through a rather unusual route, considering the furor in compensatory education since 1965. We came to it through a long standing interest in how people got to be competent.

Now, the first thing we did, when given the job to find out how to provide the experiences to get children to age six as well prepared as possible, was to try to identify what was meant by "well-prepared at age six." Now, a lot of teachers know a lot about that subject

*White, p. 76
**White, p. 77
***White, p. 77

at an intuitive level in the same sense that a lot of middle-class mothers do good work, very good work, with their children in the early child-rearing years but can't express their ideas on the topic in useful ways. Well, our answer to this problem was to do what a man like Konrad Lorenz does when studying an exotic creature like a water shrew. Assume that you know very little about the creature; go out to wherever he lives and watch him with several ideas in mind: What are the abilities he manifests? What are the kinds of problem areas that he gets into? How does he cope with them? What gets in his way? What helps him? And so forth. So we spent the first couple of years of the project on this problem of trying to figure out, in a detailed way, what we meant by a really talented six year old child. On the basis of observational work by a staff of fifteen reasonably well-trained people in child development, following very talented and untalented three, four, five and six year olds around in homes, on playgrounds, in nursery schools, in their classes, etc., we came out with what we consider to be a reasonable working definition of competence. We wanted to follow, not only the very bright child, but also the child that wasn't doing well because you've got to have some basis for knowing what's special and what isn't about the very talented child. One problem when you go into a center that specializes in pathology in children is, without having an adequate background in the normal behavior of normal children, it's hard for such personnel to be able to tell what's really serious in the way of an aberration with a child referred because of a symptom. For example, I don't believe that, given the average 1,000 children, the sensory and motor abilities of six-year olds or four or five-year olds are grossly different. That doesn't mean that sensory and motor learning disabilities don't exist; but I don't think they account for a great deal of what's wrong with the typical child who is educationally disadvantaged at six; nor are such children any less likable than their peers. We have had plenty of experience to indicate that the child who is not doing well may very well be a delightful creature. He may laugh a lot, be friendly and so forth. The attributes that distinguish the two groups, on the other hand, we think, go as follows. Now, clearly, you would expect to find, and we did find, linguistic and intellectual differences. The child who is very talented is great at language, and the poorly-developed child is clearly deficient. We were looking for attributes of these commonly understood areas which would help guide our observational work on the etiology of these things, so we picked out aspects of language ability that we could work with in the future out of the complex of linguistic and intellectual abilities. We found, for example, that sheer grammatical capacity, the number of grammatical forms they had at their disposal, was a good index. We found sheer vocabulary a good index. We found, surprisingly enough, clear articulation to be a sign of the very talented child; and we found a simple tendency to do an awful lot of talking. Now, there were exceptions; but, on the average, these differences held.

Now, in the area of intellectual competence, the ability to sense dissonance or note discrepancies, these children could do this in all areas, whether it was a physical discrepancy, as when a four-year old notices that another child has had a haircut. The talented child spots this change first. Or, if somebody goes out of turn in a game, the

talented child spots it first. Or when somebody breaks a rule, this child spots it first. Regarding the ability to anticipate consequences, talented children seem to look forward in time so if a clumsy child picks something up and starts to move across the room, this child knows what's coming and expresses what's going to come. The ability to deal with abstractions is another distinguishing dimension; talented children are much more proficient in number, letter and abstract-principle work. As for the ability to take the perspective of another, this particular ability was emphasized by Piaget in his studies that were published forty-five years ago. Regarding the ability to make interesting associations, these children, routinely, take off on their own and recite long, inventive stories.

There were a couple of other dimensions that weren't quite so commonly focused on by people--executive abilities, for example. Talented children are very capable of planning and carrying out multi-stepped activities. And they are also very capable of using resources effectively. And, finally, one that intrigues me, when given near work to do, that is, desk work, in a situation where there are things going on around them, these children display an interesting attentional pattern. They can keep track of what they're doing and, simultaneously, keep tabs on what is going on around them, which is a marvelous device when you think of it. It means that if somebody near them has dropped a piece of a puzzle and doesn't know where it has gone and the teacher doesn't know, this child is likely to know. Furthermore, this child can ward off things that are going to be happening to him. If somebody approaches him, he's capable of dealing with the interruption smoothly. Secondly, he can make a transition to a new behavior or new activity better than somebody else. The child who is not making it has barely gotten to the point where he can maintain concentrated focus, even at six-years old, for protracted periods of time. And he is also peculiarly socially dependent. If another child comes along and entices him a bit, this child is likely to abandon his task.

In the rest of the definition of competence, we were, particularly, struck by something that good teachers have, for years, been trying to say but haven't been able to convince many people about; and that is the area of social abilities. These talented children were markedly different from the untalented children with respect to the way they moved in and out of the world of their peers and the world of the adults. They had all sorts of little skills that made them very sophisticated about social relations. They had, of course, altogether different attitudes toward authority figures. Where the child who is developing slowly would look to the teacher, partially with fear, for authority, for protection, for rules and regulations, these children tended to look to the teacher as almost another peer, a peer with more talent and a peer who was willing to help and was essentially there to serve. If necessary, they'd be willing to go to the peer for protection. They held conversations with adults which were not oriented around, "He took my ball away" or "I need another cookie" or something, but were rather interesting conversations, not focused on their own immediate needs. Anyway, the subsidiary mechanisms that they are skillful at are things like getting and maintaining the attention of adults in socially acceptable ways. They have a wide variety of mechanisms

for doing that, using adults as resources, expressing both hostility and affection to adults. That is, these children are not locked into a pattern of only saying nice things and looking for the teacher's praise as the be all and end all of their lives. They are perfectly willing to tell the teacher to buzz off. They can also express fondness, can lead or follow their peers. They are capable of assuming a follower role, and I guess that translates into the idea that they don't always have to have their way. They are secure. They compete with peers. Now, this latter point can be translated into ideas about achievement motivation as well as task orientation. They show pride in their achievements, whether they are products or activities; and they involve themselves in adult role play behavior and in other ways express a desire to grow up. Now, we should submit that, in spite of the fact that there are unquestionably errors in the way that we got to this definition and that it is not perfect, that if you get a child that is very good on these ability dimensions, you've got someone who is getting there.

We tracked down these manifestations in children five, four and three years old in the second year of the study and came to a judgment, which, though not based on hard data, was one we were willing to risk a big investment on, that if things have gone extremely well in the first three years of a child's life, he's developed most of these abilities already. He doesn't have as much proficiency as he will have at four and five years old, etc. He's not particularly very adept at taking the perspective of another or dealing with abstractions as yet, but he's got a good piece of the rest of the pattern. Now, if there is any truth to that point, then what follows? Remember the first set of curves I put on the board. If, in fact, much of what strikes us as being really outstanding about the best of our six-year olds can be largely achieved by a three-year old; and, if, in fact, nothing much seems to differentiate any 1,000 one-year olds, then something emerges between one and three years of age. And, secondly, we don't have schools for children under three. So either experience makes no difference; or to the extent that it does, the foolish stuff that they do day in and day out in the homes, their play activities in the first three years, can be extraordinarily fruitful. The things that mothers are doing when they're really succeeding, although based on intuitive feelings, probably have a major role in the design of the curriculum that we're looking for. And that is why I drew the curves that I drew. So we are now spending all of our time trying to do what people who have studied the bat have done to understand sonar processes with the process of the development of competence in humans. You know the bat uses sonar principles to catch moths in the dark. Now, as long as an example of what you are interested in knowing occurs in nature, my feeling is that those of us who aren't bright enough to create things de novo ought to try to unravel those examples of excellence, or whatever it is we are interested in <u>if</u> they do occur and <u>as</u> they do occur in nature. That's the principle that guides our work. Now, that is not to say that what a Bereiter does or what a Schaefer does when they apply special techniques to a compensatory education problem is wrong. Such an approach is equally valid. It's just that there are two ways to build curriculum. You can go the way

Gagne does where he analyzes an educational job in an engineering fashion and figures out the best way of doing it; and that is what evolved in Earl's study; and that's the way Carl Bereiter did his work; or you can take this other route which, I think, requires less brain power. If you can find clues to good practice in nature, then analyze the hell out of them. Now, we couldn't easily find examples of excellent practice in nature the first six months of life. We just had kids who were being reared in monotonous circumstances, and we had to build curricula using the Bereiter-Schaefer principles. We took our cues from what the child was capable of doing and interested in doing. But, as long as we've got mothers doing a great job, why not learn from them? One reason people haven't learned from them is that such work is expensive and laborious. Another reason is that research done in the home constitutes possible invasion of privacy. We don't bring young children into the lab because, although, in the excellent work that Hess and Shipman, (1965), did, for example, you learn something about teaching styles with their elegant etch-a-sketch situation, you don't necessarily know how often and when that mother actually uses that teaching style with her child in his daily life. We have seen many middle-class mothers who seem to be failing because, although they have all sorts of tutorial talents, they don't use them. They may spend their time sponsoring Aid to Retarded Children Societies and other community ventures while their youngster stays home. In some cases, they are relatively oblivious to the importance of these years; or, less commonly, they don't like children of that age. Two year old boys are not always very likable.

The environmental factors we are concentrating on now center around the mother. Now, I am sympathetic to those people who are interested in the role of the father. I am also sympathetic to those people who are interested in the role of the sibling. But I can say, with confidence, that during the first three years of life, fathers do not interact directly with children in any significant way on weekdays between 8:30 and 5:00. We have been in approximately 600 homes of children throughout that age range throughout the last two years. Fathers are rarely around during those daily periods which do constitute most of the child's opportunities for learning. Now, that doesn't mean fathers aren't important. What it does mean is that the influence of the father for the less than three year old child probably is indirect. That is, if he ruins the fabric of life for his wife, obviously, he is going to have a subsequent influence on his child. If he makes his wife a stimulated, excited, loved woman and, in fact, teachers her a little bit about child development, as at my home, then he can unquestionably make a major contribution. The one thing my wife really loves about my profession is that I had changed, perhaps, 7,000 diapers by the time our first child arrived; and, through four children, I have been the prime diaper changer. Anyhow, the father can have, obviously, an indirect influence. And, furthermore, he might have an influence after 5:30 p.m. and before the child goes to bed and before 8:30 in the morning. But think of your own homes. In the morning, there is breakfast; and there are a variety of other things; and some children don't wake up much before eight o'clock, if they are two year olds. Others wake up at six o'clock, of course. Some children go to sleep at 7 or 7:30 at

night, and there is dinner to worry about. Some fathers don't get home at 5:30. So I would say the best guess that I can make as to how much we can get the father to interact directly during weekdays is concerned is that it is probably low. I just came back from Barton, Vermont, which is out in nowhere in the north of Vermont; and there you have an interesting poverty condition. The families are intact, and the fathers are home. The small dairy farm has gone out of existence, and lots of fathers are home most of the day. Now under those circumstances, fine, let's use the father. But, by and large, he just isn't functional. Now, the weekend is a possible period when fathers could be involved. Nobody knows what the minimum amount of input from a father might be if it were going to be valuable. It might be that just a little bit of child rearing, just a few hours each day and on Saturday and Sunday would be adequate.

We think the mother, either in what she does directly or in her indirect influence in the kind of schedule she sets up for the baby's day, the kinds of materials she provides for the baby, the kind of access to different experiences she provides, is the prime factor in structuring the child's experience and influencing his early growth. Now, what that statement means is that to be a mere mother of a two-year old is not to be a mere mother. It's an important job. It may be one of the most important jobs that society has because if it gets a child going in the right direction, that's something worth doing. There are other things that follow from that, but I won't get into them.

We divide environmental factors into the mother's proximal input and her remote input. By near input, we mean what she does when she is actually with or near the child. The first question we ask is: "How much of such activity is there?" We are gathering such information. Secondly, what kind of interaction is it? Does she generate initiative on the child's part, or is she planning for Radcliffe with the child and scheduling every moment so that the child is smothering in curriculum from her? Does she stimulate the child's interest, using the props that Earl talked about; or is she suppressing those interests by virtue of a highly-structured curriculum which may not be interesting to the kid? Is she restrictive or open? There are real dangers when an infant first begins to move around the house. He can hurt himself when he locomotes in a living area with stairs and windows, etc. Well, mothers react very differently to this situation. One of the few ways middle-class mothers seem to be failing in our studies is when they over react to the possibility of the child either hurting himself or destroying something they treasure. Is the maternal action verbal, or is it mute or gestural? Mothers differ very much on that dimension. Is the material or is the activity developmentally appropriate, or is it too old or too young? A lot of mothers talk right over the heads of their two-year olds; and others, with their three-year olds are talking way down here when the child understands much more than he produces and much more than the mother gives him credit for. Is it a kind of obsequious situation, or is it balanced? By that, I mean is she gushy all the time; is she afraid to admit the notion that she dislikes some of her child's behavior, that she occasionally hates him or that he's an occasional nuisance? In other words, does she have a balanced affective relationship, or

does she go one way or the other? One way is rejection; the other way is an unreal kind of relationship. And the last thing, is she obsessed with success; or is she balanced? Does she have fun in the learning? Does she prepare the child for what he is going to come into ahead, or is she unrealistically custom-building his world so beautifully that he is going to panic when he gets into the group of nursery school kids?

I want to emphasize the fact that ours is not just a class study. We look at middle-class failures and lower-class successes, as well as middle class extraordinary success and lower class extraordinary failure. One of the classical ways that middle-class mothers go down the drain is that they get a first child and are determined to do everything under the sun for it. They hover over it and anticipate every need. The child doesn't have to develop any mechanisms for getting anybody's attention. It doesn't have to develop clear articulation or expressive powers because the mother is practically reading its mind; and the child thinks the whole world revolves around him. Then another child is born two years later. The first child is packed off to nursery school; and the phone rings; and the nursery school teacher says: "We can't handle your child; he's aggressive." Now, the child will get over it under certain circumstances. But we have seen this pattern over and over again as a middle-class pattern, suggesting if you try too hard you can get yourself into a bind, too.

The best mothers we see often keep up a running pattern with their children, even when they are fifteen feet away. The mother who is not making it is likely to only respond to the child when forced to or when she has to control him.

Now, the remote influence--in the physical environment, does she provide suitable toys? Does she allow access to the possessions of the siblings? Does she allow access to the household items like the pots and pans, the radios and so forth? And with regard to social environment, is she there? What kind of a substitute is there if she is not? Can the siblings interact if they want to? We find relatively little of this dramatic business of nine year old girls mothering two year old kids. They may do it for the movies, but they don't do it too often in real life. Does the child contact non-family members? Here the question is the range of experience.

My perception of our needs in the area of early education goes like this. First of all, we need massive public education. I agree with Earl; if we have the commitment to do something about this early age range, then we are going to be able to lick the job. But you need the commitment; and part of that involves public education because it is amazing to me how few people, outside of groups of this sort, really are either aware of or committed to this kind of notion. Secondly, the latest knowledge about child-rearing practices ought to get into the public-school curriculum right from the elementary grades up. Thirdly, I would recommend that we consider the utilization of first-rate mothers who are not now working. There is a vast pool of good hearted and very capable people whose children are now off to school, for example. They're emancipated. And some of them, after that first feeling of freedom for a year or two where they say, "Thank God, I can live again" decide that

they want to do something useful. Many of them go back and get advanced degrees. Others simply find that they've got nothing much to do, and God knows what happens to them. But they do constitute a valuable manpower pool, and you probably wouldn't have to really pay them in all cases. There are lower-class mothers that fall into the same category. Some of them seem to do a fine job rearing their young children. We used to think that you had to have a first rate college education, be verbal, be creative, etc. to get a child to age three in fine shape. We no longer think so. We've seen too many lower-class children of age three that are every bit as competent as the best middle-class children.

Some people believe that parent-child centers with professional staffing would constitute a threat to the solidarity of the family. I'd like to discuss two aspects of that possibility. I would hazard a guess that one reason why Ira Gordon's study of intervention in the first year has not produced dramatic results is that he watered down the quality of his teaching personnel by not doing what Earl did with first rate, intelligent, trained, college-educated people. He utilized low-income mothers to teach other low-income mothers and then failed to monitor what the latter did with their children in the home. Now, he gave up something for the virtues of parent participation. Maybe it doesn't have to be an all or none affair. Maybe we can have a balance of doses of very high-quality inputs, alternating with the efforts of natural mothers. I don't think we should overlook the fact that there are different levels of quality of maternal teaching.

My last point is that throughout all the intervention studies that I have seen and throughout our own work in watching first rate child rearing practices, there is one theme that seems to be associated with success. One to one informal, supportive, verbal and motivating experience seems to be at the heart of successful programs for one to six-year olds. Such experience was featured in Dr. Schaefer's study. It was a central factor in Frank Palmer's study in New York. It happened in Courtney Cazden's study of language tutoring in Boston. I think that the interesting thing that comes to my mind when Earl talks about props is that if used well they keep the child interested. But the core process in all of these experiences, in my opinion, is motivational. The point is not whether you learn to read at three or whether you learn to reach at six months. It's whether you learn to really care to learn and to explore. I think you really maximize such a concern in the one on one informal, supportive, verbal, motivating experience. I think that goal should be at the heart of any curriculum for children one to six years of age.

Discussion from Panelists.

Dr. Schaefer:

One comment I wanted to make in response to Burt was that we didn't rush into this infant education program before we had looked at parent behavior and child behavior for awhile. In fact, I probably spent at least five years with Nancy Bayley analyzing her longitudinal data on parent behavior and child behavior; and, in the course of that, we

developed, first, two dimensional conceptual models for maternal behavior. In working further in these areas, I developed three dimensional models from both of these, which plot beautifully as spheres; so I have a sphere of maternal behavior and a sphere of child behavior. I try to relate the sphere for maternal behavior to the sphere for child behavior. And I was very pleased with this activity up to this point, when a Polish psychologist, Dr. Barbska, came through and I showed her these models. I was very proud of them; and she looked at me and she said: "All this is very nice, but if you really understood these things, you'd go out and try to change them." Well, that woman moved me, you know. And I think, if we really think we understand something about early child development, we ought to go out and try to see whether we can change it. And I think, if we really have any convictions about the importance of families and the extra-academic system, we ought to go out and try to change it.

Dr. White:

What can I say. I agree whole heartedly. I wasn't referring to any particular study. I do think that in the academic world they are used to discriminate so called basic research from applied research, but that is not a very good distinction. The point is, if you've got an emergency, if you have a fire, you can't wait until you learn the finest method of fire prevention. And I would be the last one to say that people doing intervention studies should wait until they know for sure what to do. I wouldn't even be venturing these previews of coming attractions on what excellence in child-rearing practices are if I didn't feel a strong sense of urgency. But I do think we have a big enough research operation to encompass both those people who are trying now on the basis of the best guesses we have available to accomplish change and, also, those people who are trying to find routes to improving our best guesses. Now, that doesn't mean you can't improve your best guesses by being out there and trying; but my particular way is a very slow one.

Dr. Haywood:

I would like to make one or two remarks. The thing about feeling that one ought to get out and do something about a situation that you think you have some information on is this--that you may not be right. One of my colleagues returned from an extensive tour of the educational system in the Soviet Union and was greatly impressed with many of the things that were going on but also made this kind of observation: that in the United States it is so difficult to get school systems to change things that if you have an experimental educational intervention program, the most you can do, if it's a bad one, is to mess up a few children. If you mount a massive program and get massive support for it and the program is wrong, you mess up millions of children. And I think the opposite is also true, of course; if you have massive support and your program is right, you benefit millions of children. But the point still is there that it is important to do two kinds of things. One, it's vastly important to field test intervention programs on limited

numbers of children to start with; and the second-related point that is so obvious to all of you that I don't even need to make it, except that I am so angry with people who have been arguing against it sometimes, that it's vital to have untreated comparison groups. It is a wildly optimistic point of view to assume that many of the things that we have been talking about here today and that we will talk about the rest of today and tomorrow are so proved, so tested out and demonstrated that we can rely on all the programs that can be devised on the basis of them. So I would just like to get those points in.

Dr. Silverman:

I have two points. First, how do we get parents committed to become change agents? How do we get school people to be committed in terms of parents becoming change agents? And I guess this reflects my own philosophy as, at least, an intellectual activist to some extent. This whole thing of commitment, to me, is basic to getting anything done; and I'd like to hear some of your comments on this, Dr. White.

Dr. White:

I think there is hope. I think within the bosom of every single mother who exists, there is, at least, the kernel of the desire, "I want my child to have the best possible life." Now, circumstances can do a lot to stunt the growth of that feeling; and I don't think we should, necessarily, hold it against the woman with a miserable existence if she doesn't do an extraordinary job. Sometimes it is just a matter of energy level. I can think of a family with seven children with a mother who is about twenty-nine and has lost most of her teeth already. The father is rarely around. The mother lives in an unpleasant apartment which smells of human urine. For her to just get through the day is enough. It's unrealistic to expect her to provide excellent tutoring for her children. So there are some situations that will have to be approached, not on the basis of what we know a child ought to have, but, in terms of the over-all economy of the situation. Secondly, I am encouraged by this miraculous conversion that's taken place among a goodly number of Negro families in urban centers; and I want to say this carefully because I don't want to say something that will offend somebody. But an awful lot of Negro mothers have, apparently, turned Jewish with respect to their valuation of education, especially early education. Many people who run centers, and I have been involved with a couple myself, have said that the fervor they see in the parents, not all of them, but a substantial segment of the parents in their centers, with respect to urging the professional staff to do better, can remind them only of the way in which Jewish people in this country have held education up as the most important goal for their children over the last several decades. Now, I think that trend is very healthy; and we can build on it.

Dr. Silverman:

You know, we have a whole new culture of "My son, the doctor."

Dr. White:

You know the old story about the woman who ran into the lobby at Miami Beach at the height of the season and said: "Is there a doctor in the house? Is there a doctor in the house? Is there a doctor in the house?" Everybody was alarmed, and finally somebody raced up and said: "Yes, ma'am, I'm a doctor. What can I do for you?" She said: "I want you should meet my daughter."

Dr. Silverman:

I have one more question. This one relates to some specific aspects of some of the research that Dr. White presented, in particular to the research dealing with the children from three to six years of age. What were your original criteria for differentiating your talented from your non-talented groups? In other words, how did you measure initially the difference between a high-competency individual and a low-competency individual?

Dr. White:

That's a very basic question. We took calculated risks, but I think, in a manner, which led us to the identification of those children in a way, which, no matter what route you took, would produce the same results. We used three sets of guides. We used teacher judgments. We used the judgments of fifteen independent child development research people on our staff, and we used objective test scores. We used teachers who had been around for awhile and were rated as superb teachers by their peers and their supervisors. We said to them: "If you've got thirty kids in your group, we'd like you to tell us, on the basis of your experience with those children, which one, two or three strike you, if any in that thirty, as being extremely capable children, children who, no matter what they confront, whether it be the problem of a stuck zipper or a Cuisinaire rod, a didactic situation or trying to get something from another child or from you, children who, no matter what the problem at hand, cope with it superbly." Now, we have yet to find a pro teacher who can't immediately point out a small number of children of this sort. If you try to ask them for children who are somewhere around the central tendency or a little bit above average, then everything falls apart. But if you ask them only for the very special child, they have no difficulty in their minds making the distinction. We then asked them for the child, who, while he had both his eyes and his ears and was physically intact and was not in depth therapy at age four, five or six, simply struck them as being essentially helpless, who seemed to be floating through the day, who never seemed to be able to do anything well. They had no trouble identifying those. Now, in some instances, neither of those kids existed in the classroom. Often, the teacher would just say: "We've got an average group." We didn't pursue it. We then had the same groups of thirty or fifteen, depending upon whether it was a kindergarten or a pre-school, examined on alternate weeks by fifteen different observers, without letting them know what the teacher judgments were, and got from them the same sort of nominations. We then tested all of these children. If all signs pointed in the same

direction, we said: "We think we've got a member of our core group either very competent or relatively incompetent." Unquestionably, we've made a few mistakes, but I think, by any criteria, these kids are outstanding.

We then had our fifteen observers follow these children around to try to determine what it was that they did, what they manifested in the way of abilities, which really underlie this gut feeling that people had that they were either great or weak.

Dr. Schaefer:

I'd like to ask if these criteria for talented youngsters have been applied to a general total sample of classrooms and, if so, whether the different criteria really correlate with one another across a group. It sounds to me like there may be several elements that are combined in this pattern of a talented youngster, and I wonder if they might be differentiated in a more random sample?

Dr. White:

Well, we did not attempt to look at all the infinite numbers of combinations of abilities on these dimensions across large numbers of children. That is, you find children who are very precocious in intellectual realms but who by most standards are social cripples. We didn't bother with that particular kind of a child. We were looking for a generally all around, competent human being. Our core groups came out of a very large population. In the first year alone, we studied seventeen pre-schools and kindergartens, with usually two or three classes, varying from urban low income to the finest families of New England, including rural areas all around the Eastern Massachusetts area. We are aware of the fact that the mechanisms of getting the attention of the teacher will vary with the particular situation. That is, in some worlds you have to get the attention of the teacher by being forthright, verbal and aggressive. In other words, you can achieve the same end by different kinds of mechanisms. So, if you look at the behaviors of these children, they are not identical. But the end result generally is a kind of invariance which we think we can use.

Questions from the Audience.

Question:

Dr. White, you mentioned the Gesell developmental schedule, and you said that in the discovery of hands you noticed that some evidence of this was shown around forty days and then sixty days; and then you said that in the Gesell this was ninety days. I was wondering what your opinion is of a forty year old developmental schedule, in terms of the work that you did with infants.

Dr. White:

In other words, how valid are the Gesell schedules? Well, since

we were studying infancy in institutionally-reared children, we haven't gotten direct evidence on the current validity of the Gesell schedules. The only way we could get that is to actually take a look at the samples similar to Gesell's, which were 109 children of professional people around Yale forty years ago. The reason that I say that is that I am too impressed by the possibilities of the influence of experience on those landmark achievements to assume that what we got in our institutional kids in any one of those rearing conditions was parallel to the Yale children. I doubt very much that the Gesell landmarks are out of date. I think they're generally probably true. I don't think that child-rearing practices in this country in the last forty years in the first year of life have really made very big shifts. I think that we'll see a change in that. The toy industry is now very much interested in the first year of life. The parent-child center run off will hit the middle classes, and the federal government and the state governments are planning on some sort of input into middle-class homes in this early year. The congressional group that represents California has a staff which is very anxious to have some sort of master plan for what they are to do as a state for early education. They don't think, politically, they can get away with concentrating exclusively on low-income families; and they are intrigued by the notion that the study of the early education of the non-disadvantaged child could help them.

Question:

The child that took 120 days before it was aware of its hand--was that a child that was physically ill, or is it probably a mentally-retarded child?

Dr. White:

No, that was one of Jean Piaget's three children. The genetics were probably in good shape. His best guess as to why that child was so slow in discovering the hand and then pursuing the development of the object world, which he thinks starts with hand discovery and reaching, was that that child was growing up during the winter and was kept outdoors on the porch and bundled up quite a bit and, therefore, simply didn't have the opportunity to have that hand swinging in front of her eyes. I think it was a girl.

Question:

Dr. White, where would your research fit in with Arthur Jensen's idea of the difference in genetics?

Dr. White:

I bet everyone of us today and tomorrow is going to get a shot at answering the Jensen position. I think that 1970 is probably at least thirty years too soon to have a firm conclusion on the relative contributions of environment and heredity to development. For example, when you say that children are identical twins but are reared in different environments, that, immediately, to the scientific mind, says:

"Well, how different are the environments?" And you can't go any further with the argument unless you know quantitatively how different the environments are. We are nowhere near prepared to measure environments in terms of their differences. That's a very complicated scientific problem, much tougher than just measuring how a child progresses in intellectual and linguistic function. Secondly, there is only one way to know the limits of environmental influence; and that is what Earl has been talking about and what I have been advocating, continuous maximization of potential for growth (as Joe Hunt talks about), designing the environmental match for the child's developmental level from the time he's born, continuously, at least, the first ten or fifteen years of life. When we've done that with children, either matched because they have known genetic identity or randomized and controlled for equal genetic inputs, then we'll know something solid about environment. But, just think of the engineering job that is. You've got to know all about what's developing that's important and relevant at each stage of the game. We've got a gross weakness in assessment instruments throughout the first three years of life. And it isn't going to be eliminated as a bottleneck in the next five or ten years. It is a big job. In addition, you have got to know how to structure the environment for a particular child; otherwise, you are not doing anything functional or relevant; and you've got to keep doing it at some rate parallel to the rate at which that particular child is developing. We are not ready to make firm statements of that sort. In my classes, I've got student after student saying: "What do you think of the Jensen Report?" I think it is premature. I don't think he has a justification for his conclusions; and I have a strong feeling from the evidence that I have seen that what goes on around children influences their learning very strongly; and that's the faith that I operate on.

Question:

You talked of structuring the environment, and you alluded to optimal kinds of sensory stimulation for infants. Would you speak a little on over stimulation of infants.

Dr. White:

Well, the only things that come to mind are that a fair number of people, often people concerned with emotional pathology, have said at times that over stimulation is a danger with young children; beware of it. Now, to my mind, such statements have not been based on any solid collection of evidence; but it has been a principle that has been espoused.

Question:

Haven't Russian psychologists found --

Dr. White:

Found that over stimulation is harmful? Is that what you mean?

Question:

That there is a danger in over stimulation?

Dr. White:

Well, if they have, I am not aware of it. Now, I did find in one of my experimental conditions something tantamount to over stimulation. We didn't see any obvious traumas resulting from it. But we had children whimpering a little and going to sleep. You might consider an oppressive, overly ambitious mother as an over stimulator; but I don't have hard evidence on that. All I have is the gut feeling that what you can do is interfere with the natural development of intrinsic interest and learning that way. You can turn a kid off, but I am not sure yet. I haven't followed this long enough and measured it well enough to be able to say. Beyond that, I can't think of many studies of children in the pre-school years addressed to the question of over stimulation. There have been statements made by leading figures that the home of the low income, disadvantaged child is one of over stimulation. But it takes a lot of good anthropological work to provide the actual evidence, and that has not been done. It is beginning to be done now. You have to take those statements with a grain of salt.

Final Comments by Dr. Carl Haywood.

Well, I think that what I have heard Dr. White saying is that he would suggest that we see both early and subsequent educational systems as a kind of feedback loop in which the curriculum depends upon the constant feedback on mastery; that we see, in perhaps a Piagetian sense, development as a sequential series of phenomena in which the sequence may be relatively stable across individuals, but the timing of the occurrence of each step in the sequence is not rigidly determined and can be manipulated; that in the individual child one monitors constantly his level of mastery of the skills that are being dealt with that it's his task to accomplish at any given time; that, on the basis of the feedback from that monitoring system, we constantly alter the curriculum in terms of the child's developmental needs. This has some rather profound implications, I think, for educational systems, both pre-school and otherwise. It may very well mean the demise of the system that produces 12,000,000 grade one, level one books, for example, and says everyone who is between six and seven years old will use these materials and will have these goals.

Well, I warned Dr. White in advance that I intended to stick his neck out; and that's what I'm doing now. It seems to me that Dr. White's work on the first six months of life indicates that the rate of development of skills is jointly dependent upon the child's developmental level and the nature of the skill required, as well as the nature of the experiential opportunities available to the child, that special experience and restructuring of the environment can hasten the development of particular skills if the appropriate experiences are imposed at the right time. One of the things that his curves show is that, past a certain point on the abscissa of those curves, that is the time line, the age line, the imposition of special experiences results in a faster

development of certain primary skills. Below that point, the experiences don't result in much of anything, which rather emphasizes the crucial nature of matching the kind of experience you're imposing with the current developmental level of the child.

During his principal presentation, Dr. White interpreted his observed differences between competent and not so competent children as differences in ability. An alternative interpretation is that such behavioral differences reflect differences in inclination or in motivation, as Dr. White mentioned toward the end of his address. For example, in interaction with adults, the less talented child might have learned just as efficiently as the talented child has learned, but has learned a different and, ultimately, less productive mode of interaction. For example, the economically-deprived child very frequently learns that how you behave in front of authority figures is "shyly." That is, do what they want you to do; don't give them any trouble. The middle-class child is more likely to learn that, if there's a breakdown in the system, it is just as likely to be the fault of the authority person as it is to be the fault of the child. So the middle-class mother goes storming down to the school and says: "My child is not doing well. What's wrong with you?" The mother in the deprived family, upon learning that her child isn't doing well, doesn't go storming down to the school and says to the child: "What's wrong with you? Why can't you do well?" So I think a different mode of interaction is learned that may reflect differences in motivation, differences in prior learning of social interaction systems, rather than, or in addition to, differences in ability to handle events. I want to spend a good half of my time tomorrow talking about motivational variables and their particular place in the system.

I am interested in the question: "What are parent-child interactions that relate to the development of good versus poor school-learning skills?" And I'd like to tell you for just one or two minutes about how I think one ought to go about finding that out, and then some very tentative conclusions.

As part of the Kennedy Center operations at Peabody College, we are engaged in some behavioral ecological studies of class differences in child rearing. The behavioral ecologists go right into the home, don't do a thing, don't take a bit of data for weeks after entering the home, in fact, until they think that they've sort of become part of the woodwork--not that people don't realize they're there, but that it doesn't make any difference any more that they're there. At that point, they put on a steno mask and talk into it so that they can record their observations verbally during the time that they're observing an event, without making a big disturbance in what's going on.

Mrs. Maxine Scoggin, who is the behavioral ecologist in that system, reports the following kind of story. She was in a very economically deprived and culturally disadvantaged home for several weeks and decided that she had been there long enough to start recording data when the following event occurred. The mother was ironing; the little boy was just sort of wandering aimlessly about the room; and, at one point, he

looked at a package of cookies from the store on the counter, which was just outside his mother's peripheral vision, then looked at his mother and saw that she was not looking at him or the cookies, then looked at Mrs. Scoggin, who was looking straight at him, then turned around and took a cookie out of the package and ate it, which seemed to say: "I know you're there, but it doesn't make any difference. I'm going to do what I want to." Well, under that kind of observation situation, the differences that seem to characterize homes that produce children who do well in school and children who don't do well in school seem to include, at least, the following.

The more advantaged children, those who subsequently do better, not only have more opportunities to explore the environment but get positive reinforcement for exploration. When they do try new things, nobody says: "Stop doing that; you're getting on my nerves; you're making a mess; I don't want you doing that." Somebody is more likely to say either nothing or "That's cute; everybody look; see what he's doing; isn't that clever;" that sort of thing. There is more interaction as peers. There exists more casual conversation, not just a director and directed relationship, but a mutual interest in things between the child and the adult. There is present a model of one who can, and who dares to, manipulate the environment; that is, the adult presents a model of being able to have an effect on what happens to him and who dares to do so rather than just being a passive recipient of whatever events come along. There is conversation which has the virtue of manipulating language symbols, and simultaneously teaching the idea that thought is important, complex thoughts other than: "That is a cat; this is a bowl of soup; when is lunch?" And there is attention somewhat on demand. That is, the child learns that what he does has some effect on the adult's behavior. If he creates a ruckus, he gets attention. Sometimes he gets attention even when he doesn't create a ruckus. But I should modify that to say that there is attention on reasonable demand which teaches him that he can affect what happens. That seems to me to constitute a constellation of parent-child interaction behavior that is incomplete, to be sure, but that begins to make some sense in defining the quality of a parent-child interaction that is associated with success when the child gets to school.

Let me respond for just one moment to the stimulation question. You will recall that as late as ten years ago our principal evidence on whether it's possible to hasten intellectual development through imposing differential experience, or the evidence that we put the most confidence in at that time, had come from the animal laboratory; and we were grossly misled. We misled ourselves. We were too eager at that point. We interpreted those animal data to mean that it is the frequency and the intensity of sensory stimulation that makes the difference between an adequately developing young organism and one that doesn't develop so adequately. Because rats, if handled, if shook, if shocked, if cooled, if gentled (it didn't seem to make any difference what you did to them so long as you did something), if they had those treatments early in their lives, they became more adequate laboratory rats. They solved problems better. They were less emotional. This led us to the interpretation that it is the absence of

adequate amounts of sensory stimulation that creates learning deficits and impairments in the ability to learn in children. It was rather a gigantic logical leap. What has turned out to be a more reasonable conclusion, now that human data are coming in at a more adequate rate, is that the characteristics of the stimulation, its quality and the timing of it, make a whale of a lot of difference.

One of my former graduate students, Ted Wachs, who is now on the faculty at Purdue University, did a very nice descriptive study in Urbana and Champaign, Illinois, in which he gave the Hunt-Uzgiris scale of cognitive development, one that is based on Piagetian developmental principles, to middle and lower-class infants and young children at different age levels and found that there was no difference between the class groups in the rate of cognitive development. It was mostly sensory motor at that stage, up to about eleven months of age. However, at about eleven months, the curves started to diverge; and by the oldest age in Ted's study, which was twenty-two months, the developmental curves were quite distinctly different, with the middle-class infants having developed significantly more adequately on the Piagetian-type developmental scale. He then related these differences to what he called the stimulation value of the home based upon Betty Caldwell's scales and also related them to gross differences in the amount of environmental stimulation. Well, in the homes of some of the least adequately developing, lower-class infants, he found a greater total stimulation than in the homes of the more adequately developing children. The difference was that it was relatively undifferentiated stimulation. It was blooming, buzzing confusion, whereas, the stimulation in the middle-class homes was likely to occur more discreetly, one thing at a time, in such a manner that the child could differentiate one area of stimulation from another area of stimulation without having it all running together and occurring at the same time. Further, he found that in middle-class homes, by the time the child was one year, and in many, many cases, long before that, the principal sensory stimulation was language interaction, talking. And this was not true except for the ever present, ever turned on,television, in the other homes. He thought he had evidence for an over-stimulation effect. I think he had evidence for the importance of differentiated stimulation with the quality of the stimulation matched, somewhat, to the developmental level of the child.

I do want to say just one thing about interpreting critical periods. I think we have been skirting the issue of critical periods all along today without actually calling it that. Let's meet it head on for a moment. Based mostly upon animal research and upon growth data, not intellectual growth, but structural growth data, the critical periods hypothesis is stated strongly in the following way: that in any intervention, any event which affects growth of the organism will have no effect, if imposed before or after some maximally sensitive period in his development. The weaker statement is that there are maximally-sensitive periods and that the relative effects of the treatment will be less on either side of that critical period. It seems to me that the weak statement of the critical periods hypothesis has considerable support in the area of intellectual development, even in the animal laboratory.

I would like to seem to disagree with Dr. White on one matter that I doubt that we disagree on really. I think it's not simply a primacy effect; it's not a straight-line effect that says the earlier that you impose an intervention treatment, the greater will be the effect of it, but, once again, that the timing of the imposition of the treatment and its yield of maximum effect will depend upon what system it is you're trying to influence and what is the developmental attainment of the child in that system at the time you impose the treatment. It is a problem then of matching the experience once again to the individual's own developmental level. The most striking evidence that I have yet seen that puzzled me the most and that I must go and find out all about is the success of the Israeli program for integrating into the national culture the incredibly culturally deprived Moroccan and Algerian-Jewish children who have come into Israel over the last twenty years. These represent levels of deprivation that most of us would not even believe existed. Eighty percent of these children tested in the mentally-retarded range when tested with traditional European type intelligence tests. The thing that has struck me most strongly is that most of these children did not enter an intervention program until they were twelve-years old. They are given six years of special experience beginning with an evaluation program and moving into a structured school experience, then into youth villages. By the time they are eighteen, the prevalence of traditional intelligence test scores in the mentally-retarded range is no different than it is in the general population. In other words, it is down from eighty percent to about three to six percent. What's more, the children who have been through this program have the best record of any segment of the Israeli population in the Israeli Armed Forces. So I want to seem to disagree with Dr. White, to this extent, that if you impose a massive well-constructed program of educational intervention, you can get very significant effects, even if you don't start until the children are twelve-years old. What is left unanswered is how much better you could have done if you had started when they were one-year old.

CONTINGENCY CONTRACTING WITH PARENTS

Presentation Made at Session III, Friday Morning.

Chairman: Dr. Mitchell Silverman, Research Assistant Professor, INSTITUTE III: Exceptional Children and Adults

Speaker: Dr. Lloyd E. Homme

My early history was one of an operant conditioner of rats; and at the time I got out of graduate school, several people in the world knew they didn't want to have anything to do with me or any other operant conditioner. Mainly, this is true of educators. Educators knew we had nothing to say to each other. They said, "You're interested in rats in the laboratory; and I'm out here dealing with real live kids in the classroom; and, obviously, there is no relationship between the two." That is why I find conferences like this so encouraging, namely for two reasons. One is that rat business; and, secondly, the title of this Conference kind of grabs me, especially the early intervention business. Now, I'm old enough to remember you aren't supposed to do this; and I guess there are people who still have this notion. Jim Evans, a colleague of mine, has two children; a girl who learned to read at age three, and at age four she read at the fourth-grade level, and age five she read at the fifth-grade level, and so on. She has a brother (the control group) who is older than his sister; and, when he was growing up, Jim believed the educators and kept hands off; and he learned to read at exactly the time the educators said he should read (six and a half years of age).

Before I leave that rat business, I've got to tell you I got a chance a month or so ago to do a new edition of the Laboratory Manual. How that works: First, the publisher comes around and says, "Now we have to reprint, so if you want to fix the book go ahead." So I said "How much time do I have?" and he says, "Till yesterday afternoon." Anyway, I got a chance to fix a little bit. I think I'll tell it to you because you probably won't buy the book anyway. But I got to add some clauses that I enjoy very much, that a lab manual is a series of instructions for each experiment so anybody can do it. In one place it tells you to take your animal out and to do this and do that, check your water digger, and check your reservoir, and check your discrimination apparatus, semicolon. This is what I added: check your discrimination apparatus to see whether it is working properly, semicolon. If it is not working properly, call your mother.

Now, I'll describe what we've been doing at our laboratory; and I'll describe why I should be talking in past tense later on. I'm sure what we've been doing is not directly relevant to your interests, that is to say, educating mommies and poppies. Now, I don't think anybody really knows how to do this yet. At least, I don't. So I come here sort of under false pretenses. I thought if I admitted this to Mitch before I came, he wouldn't invite me; so I just kept quiet about it. As you know from the book (1969) the system we use is quite simple indeed. We have, for convenience sake, divided our area into two parts. One part is the task area (where the child works), and the other part is what has been known from time to time as "Kid Heaven" (where the child

receives reinforcers). In "Kid Heaven" are all the things kids like to do that we can find out about, except for sex, of course. We haven't introduced that. Roughly, the system is simply this: the child does a small amount of task, and I emphasize "small." I don't think this was emphasized enough in the contingency management book. You can tell a good behavioral engineer from a not-so-good one by his willingness to accept a small increment in behavior in the early trials until the child gets used to contracting. For example, a first trial might be as simple as, "find another letter like this one." That is to say, matching to sample in one trial. He looks around; and he finds that one; and you say, "Good, go to Heaven for awhile." He dashes to Heaven, and there he selects from a menu of reinforcing events that we have.

How we came to use a menu is a story in itself. We were working with some pre-school Indian kids; and they would dash to the reinforcing-event area, sit down and stare at each other. So we started displaying around the toys, which were available and that we wanted them to play with. This got to be so bulky that we eventually switched to the menu on which we pictured the things. The kids then dashed into the area and pointed at what they wanted to play with; and the toys were gotten for them, at which time, a timer was set; and they played until the timer went "ding." That is roughly the system we use now. The optimal way to use the menu, apparently, isn't known yet. One thing that I have noticed that is fairly reliable is that it tends to drop out, and the contingency manager quits using it after awhile. So maybe we should do something like have the child pick his high-probability behaviors for the week or something like that. I really don't know the answer. With this system, we found no difficulty teaching things like reading and arithmetic very quickly.

So we said this is working so well that we ought to have a meeting. What I am talking about is that we got together and said, "Supposing we do have the power that we sometimes think we have, that we can instill any behavior we want to in these kids, what should it be?" In other words, we had to come to grips with the frightening question of what kind of kid did we want to end up with? We all agreed that what we didn't want to end up with was a kid who knew only reading and arithmetic. We wanted, among other things, a kid who is full of joy and full of love and has a positive self-concept. With these for openers, we said, "Now, let's stop and see what we do next." Now, what we had to do, if we were behaviorists and we were instilling behaviors, notice, I said, we can instill any behavior that we want to. We aren't too good at strengthening egos and things like that, but behavior we can instill. Incidentally, when Mitch introduced me, he didn't say it right. I said, "I used to be a psychologist, but I quit." So now I'm a behavioral engineer. But any academician can tell you that I do almost everything wrong. I get stuff to work, but I don't have any significant differences. I don't have any groups. Well, since we're behaviorists, we say, "What behaviors are we trying to instill when we talk about producing a kid that's full of joy?" So we go to our elementary psychology books and look under the "J", right? I see you know what I mean. Well, there is nothing there. There are some exceptions, though, I am glad to say. I'll tell you one person who talks about joy, and that's Fred Skinner, surprisingly enough; and Keller took a shot at it awhile back; and they seemed to be in rough

agreement that just as anxiety is the anticipation of adversive events, just so joy is probably the anticipation of reinforcing events. If you're like other people, you can say that joy is certainly more than that; and I agree with you. Probably, it is; but, if it is at least that, then we can strengthen that. We can make sure the kids anticipate reinforcing events. And so, that's what we do for joy, after the kid has finished his little task, which gets longer, unsystematically, as time goes on. So we start out with a kid, asking him to find another letter like this one. We may, very shortly, reach the stage where we say, "Read these two pages; answer this progress check; then you can zip on into 'Kid Heaven.'" However, that doesn't tell it quite right, with this qualification: intermittently, on his way to "Kid Heaven," he gets stopped by a contingency manager who may say, "Tell me something good that is going to happen to you, and then you can go into 'Kid Heaven.'" So the kid will. With practice, kids become very adept at anticipating joyful events. Notice that this occurs sometimes in a group, too, where you go around in a circle and ask each kid to tell what the good things are that are going to happen to him. Notice how this differs from classical psychological treatment with kids where the name of the game is "Tell me all the bad things that have ever happened to you in your whole life, and then everything is going to be fine." We all know how well that works. So we ask instead, "Tell me all the great things that are going to happen to you, and we get joy going this way."

So the next topic we turn to then is love, and here we have the same thing. We look under the "L", and we're all set, right? So many great writers have taken up my time while they explain to me that the kind of love they're talking about is indescribable, which is kind of rough on an engineer. We have to know what behaviors we are willing to accept as reflecting or indicating love. I am not sure that we are really any place with that, except, one day we decide one behavior that we can identify that goes with love is the verbal behavior of the lover, or the person who is full of love, differs from the verbal behavior of someone who is not so full of this stuff. So, we said now, at least, we can strengthen that. Now here again, someone is going to say, "Well, love is more than that," and I could only agree. Maybe it is, but it, at least, has some verbal behavior in it. So again, as the child is charging back toward "Kid Heaven," he's intermittently stopped and asked to do some loving. No, he's stopped; and the contingency manager may say to him, "Tell me why you love your mother." I am talking about pre-school kids. "Tell me why you love your mother"; and the kid, early in the game, before he's practiced this will be taken back. You say, "Tell me one reason you love your mother, and you can go play." Middle-class kids, at least, aren't used to such a question; and it really throws them. I'm going to tell this one kid story I kind of like. This child fidgeted for a while, but he saw something he wanted to play with; and he was determined to play with this toy; so he had to come up with something. What he finally came up with was, after twitching for awhile, "I love my mother because she smells good." One of my favorites--what a great reason to love your mother. As soon as he said that, we said, "Go." And he went in and played with whatever it was that he wanted to play with until the timer went "ding;" and

then he dashed back to the task area and did some more things.

That noon, when his mother came to take him home, she reported that everything went as usual until they got home; and, suddenly, out of the blue, this little kid turned to his middle-class mother and said, "Mother, I love you because you smell good." His mother flipped. She had never heard anything like this from a middle-class little boy. It just never happens. We didn't tell her where it came from. Anyway, she was so delighted with this response she picked her son up and started flipping him around; and he said, "Hey, mother, that's swell. Do that some more." I had been coaching Mommy a little bit, and so what she read into this remark was exactly right. What he was really saying was, "Mommy, you've got a hell of a reinforcer there if you only knew it." I forgot one thing I should have told her. This kid had an eating problem all his life. His mother felt she could never get enough food into the kid, and he had been from one physician to another for appetite pills and things like that. So she knew exactly what to do when the kid told her she had a reinforcer. She said, "Sure, I'll swing you some more, but first eat that"; at which time, she reports, he ate like crazy; and he got swung some more. And, as with similar kinds of contingency management, that is for paying off for low-probability behavior--in this case, eating--she claims there is no eating problem anymore.

We've taken care of love and joy. That was fast. I am sure that, if there are any novelists in the audience, they are ready to kill me about this time. That has been my experience. One of the other things that we had to come to grips with was this complicated matter of positive self-concept. Now, there are plenty of people around who'll tell you how complicated that is; so I don't have to fool with it. But, in analyzing this from an engineering standpoint, I finally came to the same conclusion that Al Ellis did. You know Albert Ellis? He's a psychologist who got rich writing sex books. He got so rich that he now has his own Foundation; and that may be the way to do it, you know. I'd like to have my own foundation and apply to it for grants. Anyway, with respect to positive self-concept, I had to come to the same conclusion that Al Ellis did; and this is that a positive self-concept is the aggregate of sentences one says to one's self about one's self. If that's part of it, then we can strengthen the right kind of sentences. So, again, on his way to "Kid Heaven," the kid may be stopped and asked, "Tell me something good about yourself"; and we expect whatever emerges from that interchange to be strengthened and, thereby, at a covert level, occur more often. You stop the kid and say, "Tell me something good about yourself"; and he may say, "I'm a good reader." "Oh, well," you have to add, "and why?" "Tell me what you like about yourself and why." Without that, it could get very shallow indeed. But with very little practice, he learns to say, "Well, I'm a very good reader because I understand what I read. And I'm good in arithmetic because I get all my problems right," or something like that. And then, after you get through with the academic things, of course, you can move on. We don't permit them to repeat the same thing each time. They have to come up with something different. We also

do some of this in groups. We go around the circle and tell something we like about the person sitting next to us. That is a standard group technique. Then, after this, each little kid has to tell something that he likes about himself.

Oh, I meant to relate to you how it happens that kids leave the "Kid Heaven" and dash back to the task area. I think this is kind of instructive because it wasn't always so, as you can imagine, when we first started. The timer would go "ding"; and we'd say, "Fine, now get back to the task area and do some more work." And immediately, the kid would remember that there was something in that corner of the room that he has to check right away; and after he had checked that, then there was something over in this corner of the room that he had been curious about a long time, and he had to check that. You can see how this path is going to go. Meanwhile, the contingency manager is sitting there, biting his nails, and saying, "What do I do next?" Because you know we were committed to zero adversive control (punishment), and felt that there must be a way of getting that kid back to the task area without all this screwing around on the way back. The solution was so simple it almost escaped us. Now, the general rule is to reinforce behaviors we want, right? We want to strengthen getting back there fast. So the solution (it now looks obvious): If he got back there slowly, nothing happened to him except more work; if he got back fast, the contingency manager would say, "You got back here so fast I think you ought to go back and play some more," at which time he wheels around and goes back and does some more of his thing. Well, with this simple solution, the last time I looked, the children were running so fast back to the task area we were afraid they would hurt themselves. They got back fast.

I haven't really dealt with mommies very much. As I said, I'm here under sort of false pretenses; but I think it has to be recognized that the same system will work on mommies and poppies, too, that is, the system of reinforcement which Mitch has recognized. You do the following things, and you get reinforced.

But, anyway, we have, as I've said, love, joy and a positive self-concept conquered. I've run out of things to say, so if you'd ask me some questions, it would look better.

Discussion from Panelists.

Dr. Silverman:

Again this morning, we will start our questioning with our panel; and then, after they're through, we'll move out into the audience. I think we will probably use this period for our panel, and then we'll take our coffee break. Who would like to start off up here? Would you like to, Earl? Do you have any questions?

Dr. Schaefer:

I found that an extremely fascinating presentation of some simple ways of influencing behavior. You said you'd been working with the mother, to some extent. I'd like to hear more about that.

Dr. Homme:

Well, I wish I'd done more. She happened to be a friend with whom I discussed contingency management every once in awhile. And she, well, there are a couple of things I forgot to mention when I should have. Now, I remember them. I did get to talk to her about self-concept and things like that and contingency management. The system is so simple that there really isn't anything to it, and I think this is why it has to take some time. The mommy has to become emotionally committed and willing to pay off for behavior. Now, the big hang-up that I see is that they have to be persuaded that this is not bribery and that you are not spoiling a kid by paying him off. Exactly, how do you do that, I really don't know.

There are a couple of other things going on in this little situation that I was telling you about that I should mention because they are important, and they are powerful. One of these is group norms. In this regard, we have finally found something useful to do with visitors. They are usually the most annoying things around. But we have found something useful to do with them, and I am sure you could do the same. While taking visitors around, we look for instances of behavior that we want to see more of and then simply assert to the visitor that this is a group norm. For example, we take a visitor around; and, if one kid happens to be helping another at a given time, then we announce to the visitor in sufficient volume so the kids can hear what we are saying, "Notice that the kids all help each other here." And we say, "Look at that one, for example." Then the kids start looking around to see if there isn't something they can do for their buddy. Right away, just with that business, we get a new group norm going. The kids will tell you if you ask them, "Tell me about the group"; and they'll say, "Well, everybody helps each other here." Now, I think that's incompatible with hitting each other. The last time I looked, we truly didn't have any hitting, which is very big among three-year-olds. Hitting and crying are very in things to have happen. We established other group norms in the same way. If we see an instance of a kid working in an undistracted way, then we can point this out to the visitor and just announce that this is the way the kids are--they can't be distracted. All the kids will get to work. Or we see a kid reading; and we say, "Everybody likes to read here and is undistractible." Right away the kid who doesn't have a book will look for one because he wants to be part of the group. I am sorry I forgot to mention those because I think they are probably more important than anything we do; that is to say, the group norms are more important than anything we do, especially when new kids come and the old ones explain how things are. They will tell a new kid, "Nobody cries here; you can if you want to; but nothing happens if you do." So the new kid can cry if he wants to; but he finds out that nobody pays any attention to him; and it really is a fact that nobody cries here. Other things they explain to the kid are, "We have a good time here. We all like to learn," and so on.

Dr. Silverman:

Dr. Bereiter, would you like to comment?

Dr. Homme:

Say something nice!

Dr. Bereiter:

Really, I do like very much the idea of designing reinforcing contingencies for some of these less intellectual matters. The one anecdote that you gave at some length about the child who says he likes his mother because of the way she smells ticked off a chain of behavior that had many desirable consequences. Here, I start to wish you had some data, because these things do happen in life. Some, more or less, chance event occurs that sets off a whole chain of other events that are very desirable; but they don't happen very often; and they are balanced off by a lot of other chance events that set off chains of behaviors that have undesirable consequences. I just wondered, does this happen very often? Or are the children for the most part simply learning to recite some nice line; and there is no evidence that anything else happens, other than the purely verbal behavior that you conditioned?

Dr. Homme:

That is a good question. We have often wondered when we ask a kid, "Tell me something good that's going to happen to you," why we don't get a big fat lie. Like the kid could say, "Well, I have three tickets to the World Series next year," or something. But so far it simply hasn't happened; and, as Dr. Bereiter indicated, once that verbal behavior gets going, some other fantastic things happen.

Another thing I forgot to mention. I told you I forgot what I was going to say. Another thing that happened, and we should have foreseen this and didn't, was sort of a chance event. Instead of having two contingency managers as I described, we were training two others. And these two others happened to be great, great people. We have a lot of games that we play at our shop. One of them involves some verbal behavior like this: one contingency manager, a lady named Carol Chandless, said to the other one whose name was Gary, "Gary, you know, I really like you." You don't hear that too often in every day life, at least in my every day life. She would say, "You really do good work, Gary." Then, let me switch to a home situation once more, this lady reports that her little girl and her younger brother had fought from the day they were born. Lately, what they had been fighting over was the girl's roller skates. What would typically happen was the boy would swipe her roller skates, go out and use them; and then from then on, all hell would break loose. They would have a big fight about the roller skates. Now, after observing the kind of interchange that I have mentioned, the mother reports that the following happened. The little boy came, as usual, and stole his sister's roller skates, took them outside and started skating. Now, this is when the girl should have blown up. Rather than blowing up, the mother reports, she went out and stood with her hands on her hips and watched this kid roller skating back and forth; and she said to her little brother, "Boy, you're getting to be a great skater. You're a fast learner." The point is, all this stuff, all this verbal behavior,

involved these role models called the contingency managers. Apparently, up to that point, they had had no models like Carol Chandless; and they had no interaction model that they could substitute for fighting; but so far, this little girl has substituted these other things and has taken to verbal reinforcement of her brother rather than to belting him around. What was the question again?

Dr. Blount:

I still have a couple of comments and a question. It would seem to me that the training of the people who are paying off the children is particularly important; and I don't really see any reason why we can't do similar kinds of things with parents if we can, in some way, structure the situation so that parents are eager to participate. I am reminded of a comment Dr. Haywood made last evening when the lady who was trying to set up a guidance center said, "How do I get people in my program? I'm getting all kinds of static"; and he said that what you do is establish a control group; and you let it be known that these people are controls and that their children are in the control group; and immediately you will be flooded with calls as to why my child is not in the treatment group. Then you say, "Okay, to be in the treatment group, these are the things you do, one, two, etc.; and all of a sudden, you have your treatment group. I think the same kind of structuring can be done to get parents involved in the first place, and the kinds of things involved in being in the treatment group are the kinds of behaviors that we want parents to do when their children respond in certain ways. One of the advantages I see in this point is we can, as Dr. Homme has done, use the system of peer-group reinforcement to structure the situation. For instance, this is exactly what's happening in his classroom when the kids say, "Nobody cries. If you cry, nothing will happen," or "We help each other." This is what's happening. The group is reinforcing itself for the appropriate behavior. They are monitoring their own behavior. We can do that with children alright. We can get the younger siblings and the older siblings to structure the situation so they are paying each other off; and, of course, the behavior continues that way; and everything is hunky dory for awhile. The problem I see is, how do you go about doing similar kinds of things with parents? How do you get parents to start reinforcing themselves; because, in all cases, you can't rely on the child's behavior to keep the parents' behavior running smoothly. There have to be other things happening, not only your own involvement, in terms of encouraging parents and paying off parents, but other kinds of things. This is one thing I'd like Dr. Homme to respond to, and I'd also like him to respond to the second question. That is, what happens if on the way to "Kid Heaven," you ask the kid, "What's good about you?"; and he says, "Nothing"; or he says, "There's nothing good about me." Which commonly happens, if you hit a parent cold with a question like that?

Dr. Homme:

You're absolutely right. It has to be set up well. I am sure that most of us, if asked, "What do you like about yourself?" would have trouble responding positively. This has impressed me how weak positive

self-concept responses are in middle-class repertoires. Now, I've tried this out. If somebody says, "Tell me some bad things about yourself"; boy, they come rolling out. Some things you don't like about yourself. So the kid has to be set up carefully. For the group norms for the mommies, I really don't know how that would go, except I know that they do develop in our case. We haven't explicitly set these up; and I sometimes worry that besides making kids full of joy and love and positive self-concept and knowing arithmetic and reading, we may be building ourselves a bunch of three-year-old snobs. I say this because, at a recent party in which the Westinghouse kids were included, a visitor there noticed that the Westinghouse kids were all clustered together; and he asked the kids about this. "Why are you clinging to each other? Why don't you spread out?"; and a kid answered--a three-year-old kid, remember: He said with complete disdain, "Why, these other kids can't even read." I think some of this rubs off on the mommies and poppies, too. They are no longer ordinary mommies and poppies. They are Westinghouse mommies and poppies. So I think they reinforce each other. They tell stories to each other about how great their kids are; and then they try to top each other about how hard the kids hug, I suppose.

Questions from the Audience.

Question:

I'm an aide in a classroom of ten children where your contingency-contracting program is in effect right now; and it's working for nine out of ten children; but, there's one child in the classroom whom we have not been able to bring under control. He continuously disrupts the class, and we have not been able to find a reinforcement that will work or that he cares enough about to work for. The group-norm effect won't work because he doesn't care about any of the other children in the classroom. What can we do?

Dr. Homme:

The only thing I can think to advise is, to punt! You always run into one kid who turns out not to be an organism. He has to be governed by different rules of nature or something. I think I agree with you that you don't have a reinforcer for him. So one way to do it is simply face up to this with him. Say, "Now, what we've got for you, you don't care about; and so, we would like you to suggest something that you would work for." Sometimes they'll tell you.

Let me tell you one more story. I like to tell stories. The last kid I can think of who was like this, who wasn't an organism, is a kid who Roland Thorp got hold of who began his day by climbing on top of a desk on this side of the aisle and then jumped onto the desk on this side of the aisle, and so forth. The public school teacher who had this kid under her "control," obviously, couldn't let this go on because she could get fired if the principal walked by; so extinction was what was needed. She, too, claimed she had tried everything with this kid and nothing worked;and someone else talked to the kid's father who said

(and this is the same phrase you always get from parents, incidentally, of misbehaving kids), "I've tried everything, but nothing works." So Roland's engineer said, "Well, the first thing we've got to do is get a reinforcer." So he asked the kid, "What would you like to do if you could do anything in the world?" Without any hesitation, the kid said, and I find this touching, "I'd like to play ball with my father." So with this little bit of information, which took roughly three seconds, I suppose, the engineer arranged for the teacher to give points during the day. She started out asking the kid to sit there for a half a second or something. Desk-sitting is the incompatible behavior she wanted to strengthen. "Just sit down there one time, and I'll give you a point." She stretched out the amount of time he had to sit still to get points; and at the end of the day, the teacher claimed, "That's enough points for me to write a note to your father," which she did; and the kid could carry this home. It had been engineered beforehand that as soon as the father got one of these notes he'd jump up, and they'd go out and play ball for awhile. With this kind of treatment, the kid shaped up immediately. So what I'm saying is, sometimes, it is a matter of asking the kid.

Question:

A couple of years ago, I think, one of your major goals in contingency management was self-management, wasn't it? And, if it was, do you still have this with the smaller kids? We use this in the prison, as a form of self-management, at Draper Correctional Center. Also, I wondered if you followed the kids through a period of time to see if this persists?

Dr. Homme:

That's an excellent point. I just talked to Ken Cammeron, who runs the Westinghouse Learning Center where the kids all went; and I said, "How many contingency managers do you have, Ken?" He said, "I've got eighteen"; and I said, "What do you mean, you've got eighteen? You can't possibly have eighteen"; and he said, "Yes, I have eighteen contingency managers, sixteen kids and two adults." So, apparently, it is still going there. And that is part of our goal, to get out of the contingency managing business with the kids doing their own. That's a lot easier than we ever thought it would be. The kids go around bragging about the contingencies they've arranged. At least one three-year-old in the world ran to the freezer compartment of the refrigerator and said, "I'm going to have a popsicle"; and just as she was to reach for it, she slammed the door of the freezer and said, "No, I have to make my bed first." So she dashed upstairs, dashed back down, had her popsicle and boasted about that contingency. So the kids pick this up very soon. It is really something to think about. You know, all of us have gone to school for 3,000 years and have never had a course in self-management. That is just supposed to happen automatically. Maybe this ought to change.

Question:

I understand that you may feel that there are some who know the kind of behavior we would like to develop in children. When we report this to some people, they think that we're playing God; and I'd like to get your reaction to that. If we assume that we can modify the behavior of children, someone has to determine what that behavior is going to be. So who is going to do that, and who has that responsibility?

Dr. Homme:

Exactly. And when this point comes up all the time, people accuse me of playing God; and I say, "That is not true. I am God." That settles them down for awhile. Well, you're perfectly right. Once it looks like we do have a technology for changing behavior, people get very nervous, because we have to decide what the hell it is we want in there. That is why I brought up the love, joy and positive self-concept. These were arbitrary decisions. We just plain decided we'd rather have a kid who loves, rather than one who hates, one who's joyful, rather than sad and so on. But it is arbitrary, and we do play God. But so far I think we're all right. You have to be arbitrary when you decide when a kid's going to learn to read, because there still are people in the world you know who say, "Any kid who learns to read before he starts the first grade is permanently damaged somehow." That they can't explain to me; but the decisions are arbitrary; and it tends to make you nervous once you do assume that we have the capacity and technology now to make any kind of a kid that we want. Then we have to start saying, "What is this?"

Question:

Do you ever involve the parents in the planning of what behaviors are to be shaped?

Dr. Homme:

Well, not as much as I wish we had. But we have done a minimal amount of this. We get the parents together and tell them what we're doing and see if there is any objection. There never is. See if there is anything else they'd like to have happen, and that's a dry hole, too. So, yes and no.

Question:

Can you report anything on the later academic careers on these kids you teach to read early and on other subjects? And another question, a couple of years ago, you wrote about some of the computer-assisted instruction or technical learning environments that were being developed at Westinghouse. Can you report on where that is, if it's not top secret?

Dr. Homme:

Project Slate. I can report on where that is. It's nowhere. That was a project of Lou Wright's, who, as you know, went from the research laboratories to the Office of Education as Associate Commissioner. And when he left, that project died. There is general interest in this area; and something is happening; but it's not happening in my shop. The other point, what happens to kids when they go to ordinary school, is kind of an interesting one. I told you about Kay Evans. She's an example of the days we did nothing. Just let the kid figure this out for himself or herself, and she did. She went to school and was happy; and the teacher loved her; and she got along fine. This was at the time she was reading Tom Sawyer, stuff like that. She came home; and Jim would ask her, "What did you learn in school today?" And Kay would say: "Well, today we learned the 'kh' sound." At first Jim was furious. He said, "If you're reading Tom Sawyer, what are you learning the 'kh' sound for?" That's the way she wanted it. What she did was a lot of kids' solutions. She played the first-grade role. The teacher, as I say, loved her because she was a pretty kid and smiled a lot; and boy, did she learn fast! She must be a good teacher. But what we've been doing more recently, I think, is more sensible. We tell the teacher that this kid that's going to enter your first grade now reads according to the nationally-standardized tests at the fifth-grade level. Can you suggest what we ought to do with her; and she typically will say, "Well, I'll get some fifth-grade readers; and she can go read while I teach the other kids to read at the first-grade level." They are usually willing to do that.

Question:

Are they getting identified as geniuses?

Dr. Homme:

They're getting identified as stars. I think this will persist, which reminds me of that damn Head Start Report. Lloyd Homme had nothing to do with that.

Question:

I'd like to ask about something that you started off talking about, and that is your shift from being a psychologist to a behavioral engineer. I gather that the shift means, in part, that you would rather modify behavior than to understand behavior; and I am wondering if there isn't some possibility of the behavioral engineer talking to psychologists just the way the behavioral engineer now talks to educators, and that we may not be able to understand in terms other than contingency reinforcements what it is that's going on with children in these situations where behavior is being modified.

Dr. Homme:

You're a smart aleck, aren't you? I haven't quit talking to psychologists, really. I just quit drinking with them. That's an exaggerated position, of course. As a matter of fact, I'm a contiguity theorist really, rather than a reinforcement theorist; but I think Guthrie may have been right when he said contiguity theory explains why events are reinforcing. So there is no real conflict between these two points of view. As an engineer, though, I have to talk to psychologists just to find out what's new in case somebody asks me--for example, what to do with a porpoise in my back yard as Jim Evans did.

Question:

What if the behavior you want to change and the rewards that the child would want are equally unacceptable. I'm talking about younger teen-agers whose behavior is bad; but the rewards couldn't be given in a regular school setting, rewards such as drugs, alcohol, sex. These are early teen-agers.

Dr. Homme:

He might want to punch somebody in the nose. Another example: I have worked with teen-age street kids; and they learn what the rule is--you know, you can do anything you want in this room, sort of. I've often wondered what if one said, "I want to take some drugs." I'd guess you'd just have to say, "That's off limits in this room." But, they do choose some strange things as reinforcers. I can think of two street kids who had finished their little assignments in reading, arithmetic, whatever it was; and at that time, they went to the contingency manager; and he had a bookshelf behind him; and they looked at the bookshelf; and one of them said, "Hey, what's that back there?" The contingency manager said, "That's Russian"; and the kid said, "How about that?" And he said, "Let's learn some Russian. Can we go through that?" And we said, "Sure, after you do your arithmetic assignment," or whatever it was. So that was the way that these kids would work. First, they would do their elementary reading assignment, or whatever it was; and they would go up and get the Russian program and work on that until the timer went "ding" and go back. This illustrates, too, that we don't have to understand why something reinforces in order to use it. I have no idea to this day why Russian is such a great thing for those kids to learn. But I have a hypothesis; and that's the reason it's good to know how to write notes with Russian letters is so the fuzz can't read Russian writing.

Final Comments by Dr. Carl Haywood:

Dr. Silverman:

Do we have any more questions? Carl?

Dr. Haywood:

This one.

Dr. Silverman:

Yes, Haywood.

Dr. Homme:

The nice one.

Dr. Silverman:

You get a gentleman from Alburquerque, and right away the cowboys are wearing black and white hats.

Dr. Haywood:

I'm glad to have that pre-judgment. We'll see if it holds up. The most exciting thing to me, up to this point, in the whole conference, is that every speaker, so far, has focused upon the question, in one way or another, of the responsibility for behavior change. Who takes the responsibility, and how for behavior change? I hope to be able to point out some ways in which that has been the central focus of Dr. Homme's presentation this morning.

I was interested to hear that Dr. Homme focuses on observable behavior, rather than on intervening variables, such nicely observable behavior as joy and love and things like that. Yet, it was a little bit difficult to follow the observable nature of some of those behavior components until he started to specify that one can identify components of behavior that people would agree are related to the intervening variables that we talk about and that we hear a lot about from the dynamic psychologists who don't deal with observable behaviors at all. But it is one of the primary features of a system of behavior management that's based upon operant principles. He didn't use that word, and I hope I am correct in inferring that these procedures are part of the general operant system. The important thing is that it is absolutely essential to identify the particular behavioral components that one wishes to have recur, and to identify those behavioral components that one doesn't wish to have recur.

I am convinced that we probably distribute quite enough total reinforcers in any social interaction situation. But the trick is to identify the behavioral components that we want to recur and then to limit the application of the reinforcers to follow immediately and to be contingent upon those behavioral components. What we much more typically do is distribute our reinforcers in a somewhat more random manner so that some unacceptable behavioral components are being followed by positive reinforcement and we wind up wondering why they continue to occur. I think that one of the principal features of any behavior management program, based upon operant principles, then is a very careful analysis, not only of the child's behavior and the identification of those components of it that we want to recur, but a careful analysis of our own behavior to identify in what ways we are distributing reinforcement, whether it's contingent upon good behavior, acceptable

behavior, or whether it is simply randomly distributed, or on the basis of some irrelevant principle; for example, the principle that "it's nice to be nice" so we just distribute goodies.

I am especially fascinated with the idea of a reinforcement cafeteria. I think that is an increasingly important one, such as the "Kid Heaven" idea. It seems to me that it's only by offering self-selection of reinforcement from a wide variety of possible selections that we can maximize the probability that each child will get the reinforcement that is most effective with him individually. The beauty of the system is that it recognizes the existence of individual differences which we talk a lot about, and then kind of wish in our group designs that they would simply go away, and stop inflating the error variance and doing other annoying things to us. When we hold up a group incentive in the classroom, such as the promise of having a recess following the arithmetic lesson, there will be children in the group for whom recess is the most effective reinforcer; and there will also be some children for whom it is not. There may even be some children for whom recess is a punishment. Thus, the motivation to work for that incentive will vary across the children as a function of the relevance of the incentive to each child's individual motive system. Incidentally, freedom from work is not usually a very good motivator. One reason for that is that it teaches the attitude that a negative value is to be placed on work and that being relieved of work is a reward which leads to an avoidance of work, of learning and of achievement. I hope, with your indulgence, to say a good deal more about that on my own time this afternoon.

I was relating last night, during the conversation hour, some experiences with teaching a particular course that came back to me again this morning. I was talking about the experience of teaching a course using Nick Hobb's outline for the course rather than my own, which he called Contemporary Psychology, and which required graduate students who were not majors in psychology to read about fourteen books during the semester, one of which was always Walden II (Skinner, 1948). We always had very interesting discussions when the students came back from reading that book because they would be incensed with the idea that people could and might control and manipulate other people's behavior, thereby, removing the choice from the person whose behavior was being manipulated. I thought this was a reasonably naive interpretation, both of Walden II and of the contemporary social scene. Generally, somewhat more deep-thinking graduate student would respond, "Now, look, it's not a question of whether somebody is going to manipulate or control our behavior. The relevant question is, 'Who is going to do it, and how?,' because every minute of every day our behavior is being controlled and manipulated." I think rather than removing choice, a system such as the one that Dr. Homme proposes has as one of its central features the fact that it places the choice and the responsibility for behavior change jointly on the child and the reinforcement dispenser, whoever that might be, the parent or the teacher. Let me give you an example or two of that. I've seen my own children actually thinking over the choice when I have threatened some punishment contingent on the continuation of some undesirable behavior. In less scholarly terms

that take the form of "If you don't knock that off, I am going to _____," something or other. Sometimes they decide that they would rather continue the unacceptable behavior and accept the punishment, than to discontinue the behavior. A more familiar example of that is the oft-repeated Jack Benny routine in which he encounters the crook on the street who comes up to him and says, "Your money or your life." And there is this long pause, whereupon Jack Benny says, "I'm thinking. I'm thinking." Well, then, there is some choice in the situation. If you want the reinforcer, you will do the prescribed behavior. If you don't want the reinforcement, you don't have to do the prescribed behavior. Now, that is not quite as much choice as I would like to make it sound like; but, nevertheless, it is some choice.

There was the question from the floor, what to do about the fact that kids may want reinforcers that we find unacceptable. I would just like to remind you of what we all know already, that there is for each individual a hierarchal arrangement of desirable reinforcers, an incentive system that is arranged in hierarchal fashion. If the number one choice is unacceptable to the dispenser of reinforcements, he simply drops to number two, which will be slightly less effective in motivating the behavior change that we want, but still will have some effect. It will be slightly less effective in that it may require a few more reinforced trials to bring about a continuing shift in behavior. If number two is also unacceptable, you drop to number three, the third choice. If you have to drop low enough in the individual's reinforcement hierarchy, you wind up with a much weaker habit and one that requires a larger number of reinforced trials to establish.

I'd remind you also that we don't need to throw out everything that we have been told for the last seventy years by personality psycho-dynamics psychologists, and one thing that they have insisted upon for at least seventy years is that what people say they want is not always what they want. With respect to the pot question and that sort of thing, it seems to me that very frequently when working with juvenile offenders, that while the kid may tell you that what he wants most of all is some grass or a pop, if you continue to look into the psycho-dynamic picture, it quite generally turns out that these things are substitutes, and rather poor substitutes for things that he wants much more, but that he thinks he has far less chance of getting. An example would be inter-personal interaction things with parents. It may very well turn out that the kid would much rather play ball with the old man than to go to a pot party, but that he thinks that the probability that he's going to get to play ball with the old man is much less than the probability that he's going to have an opportunity to go to a pot party. So he moves one reinforcer up in the hierarchy and another one down, based on his estimate of his chances of getting them.

I think that is about the sum of the comments I have, and I'd be glad to respond to any further comments.

I was interested in your comment that we sort of randomly distribute our reinforcers. I don't think you really mean that from your subsequent comments. What we really do is, it seems to me, administer reinforcers at precisely the wrong time, most of the time. For example, a kid is playing in a corner by himself not bothering anybody; nobody pays any attention to him. But let him start raising hell; and all of a sudden, everybody converges, which is exactly the wrong thing to do, but almost impossible to keep from doing. Another example on which there is some data is mental hospitals. It turns out that the way to get some action in a mental hospital is to act crazy, and so that's what gets reinforced. You just walk around acting sane, and nobody is going to pay any attention to you. But, if you go up to the nurse and say, "My head is getting bigger, have you noticed?--bigger and bigger and bigger"; she'll say, "Really! Tell me more about that"; and, all of a sudden, you've got action.

Dr. Haywood:

Yes, I recall working with a psychiatrist in a student health service who had an amazing frequency of suicide gestures by clients. In a staff meeting, people had been really quite reluctant to bring this up and to call this to his attention and tell him, "Look, doctor, you've got more suicide gestures than anybody among your patients. What's going on?" Finally, it did come up in a staff meeting; and, fortunately, this was a psychiatrist who was quite open to scrutiny of the therapeutic process. So he had a few of his sessions observed and also tape recorded; and it turned out that he was so sensitized to depression and to the possibility of suicide that every time somebody even said, "Oh, life is just not worth living," he'd leap up in his seat, his eyes opened wide and his mouth dropped open; and there were all kinds of cues that he was vitally interested in this problem, whereupon, the frequency of such behavior went way up.

Dr. Homme:

I have a psychiatrist story. You know our central position is that high-frequency behaviors can be used to reinforce weaker behaviors. This one client I had something to do with had a high-frequency behavior of picking up the telephone and talking over it. And her contract read like this: (this is true) the psychiatrist said, "Well, if you ever get to feeling real bad, give me a call." So she somehow managed to get to feeling real bad so she could call Leonardo; and it had the usual effect, until Lloyd Homme got in on the act and played God.

Dr. Haywood:

Can you imagine one psycho-therapist, though, saying to a patient, "I'm tired of listening to this crap, so why don't you call me when you're feeling good."

Dr. Blount:

I think one of the things you're talking about is an idea which occurred to me while the comments were going on; that, particularly, with regard to the problem child you can't find a reinforcer for, and that is if we can alter behavior, we should also be able to alter the excitement over a given reinforcer. We should be able to shape up their desire for a given reward. This is exactly what you're talking about. You're responding, in the case of, "Call me when you feel good." The therapist is forcing them to make these kinds of responses, and we can do the same thing with kids. We have to find something which is not totally rejected by the child and then start shaping that up as being very rewarding and then use that, of course, for the payoff, the behavior that you want.

Dr. Homme:

That's an excellent point. We've run into the same thing with some poor kids we had. They started out, for example, with very little interest in tinker toys. They had never seen tinker toys before, and they had no interest. But they did have some interest in a ball; so we had one reinforcer and one non-reinforcer; so we just said, "Certainly, you can play with the ball; but, first, put these two pieces of tinker toys together." With this kind of a sequence, they were soon finding tinker toys as reinforcing as other things. They hadn't discovered pot yet.

Dr. Silverman:

I'd like to make one comment. Running through all of our talks the past three sessions, including today, there is an implicit question. How do we get the parent involved? And I think we can go one step further. We can actually become the contingency manager for parents in terms of using their child's behavior as reinforcers to them. I think this is a pretty realistic goal. In the case I am thinking of, we go into a home; and, I think, once we have the agreement to come in and we get the consent to come in, part of our contract with the parents is that they exhibit an appropriate reinforcing behavior to their child. In turn, it's circular, in a sense, because the child's behavior--and I think there's a lot of evidence for this--that a child's behavior, if it's directed toward appropriate goals and reinforcements and it's appropriate behavior, is very reinforcing, in turn, to the parent. This may be one way of solving our problem of developing the parent as an effective change agent in the home. I wonder if you'd like to comment on that a little bit.

Dr. Homme:

I think that is an entirely feasible goal; and these techniques I've mentioned, based on group norms, of course, can be used in families too, I should think. That is to say, you can find somebody to show off a family to; and you can specify their roles. You can say, "There is a lot of love in this family." You can remark to your colleague companion, as soon as you see some evidence of it, "There is a lot of

joy here; notice 'X'," and so on. I should think exactly the same techniques for instilling group norms in kids' peer groups could be used to establish norms for a family. As a matter of fact, I am personally convinced that's the way they do get established. The name of that technique I forgot to mention this morning is "ear-shotting." That doesn't mean, for those of you who worry about such matters, there's a technique called eye-shotting and nose-shotting. They don't exist yet. But there is a technique called eye-shotting that I should have mentioned. This gives us, for the first time in history, something useful to do with the inter-office memo. I constructed a forum memo one time which said, "It has come to the attention of the management that";and there were some blanks to fill in; and there was another paragraph saying, "This practice will cease immediately." So you can do the opposite thing with memos. You can dictate a memo to your secretary thanking her for that glass of water she brought you this morning. Whoever got that cup of coffee, I'd like to dictate a memo thanking them for that, and for the other millions of things secretaries do. That turns out to be a big reinforcement. She pins it on the wall. People laugh at it. So for eye-shotting, I would strongly recommend you write some notes to each other which tell what you like about each other, rather than what you dislike. You could wind up saying, "This practice will continue indefinitely, at the price of punishment."

Dr. Schaefer:

I have been sitting here all morning very happy at the sort of bringing together of more humanistic language with what some people think is a more mechanistic language of operant conditioning, because so many people are turned off by anything which seems mechanistic and manipulating and such. I really think there is a real chance to reconcile these two kinds of languages; and I wish more operant people, like Dr. Homme, would do that job. As I listened to him this morning telling how he had people say nice things about one another and having children see nice things in themselves, I was reminded of my work on parent behavior in which we had a major dimension of love-hostility; or you could call that acceptance-rejection. The thing that fascinated me was the hostile mothers only saw the negative things in their children, only said the negative things about their children; and the loving mothers seemed to see all the positive things about their children; and so my language of love-hostility and what we have heard here this morning, I think, can be reconciled; and I think the humanists and the people who have a real scientific analysis of behavior should get together and find out they're really talking about the same things. Would you agree?

PROCEDURES FOR THE DEVELOPMENT OF CONCEPTUAL AND THINKING SKILLS IN CHILDREN

Presentation made at Session IV, Friday afternoon.

Chairman: Dr. Harland C. Merriam, Professor, Early Childhood Education

Speaker: Dr. Carl Bereiter

This afternoon I want to talk about teaching thinking. In much the same course of events as Dr. Homme described this morning, I've become less interested in the teaching of reading and arithmetic and turned my consideration to what other things can be taught to young children. I think in both cases the reason for this shift in interest is simply that we already know we can teach reading and arithmetic and basic concepts to young children and are therefore ready to move on to other problems. This is not to say that reading and arithmetic are not interesting or worthwhile things to teach, nor that all the problems in teaching them have been solved. But this is a forward-looking conference, and in keeping with its spirit I should like to deal with an area where progress is just beginning to be made rather than with areas where only mop-up problems remain.

There is, however, one thing that does bother me about the forward-looking tenor of this conference and that is the considerable danger that people will just write off the things that have been accomplished in the way of teaching basic scholastic skills. For all the forward-looking things we're talking about and for everything that I'm going to talk about this afternoon there is no real evidence that any of it does any good. There is evidence that teaching reading and arithmetic and basic concepts does kids some good. Furthermore, there is evidence that it can be done and that it can be done in schools. This is not to say that we shouldn't be concerned with parent involvement. This is not to take a position on whether or not schooling should be extended down to young age levels. But I merely want to say, let's not forget that there are some material accomplishments.

A wave of pessimism has swept across the land after several evaluations of Head Start; the facile thing to say now is that age four is too late and nursery school is too little and so let's forget about that and think of other things more drastic, more thorough to do.

One well-supported conclusion from all the negative results is that pre-school education doesn't seem to do children much good unless you teach them something. There is evidence that pre-school education can do some good, that there are effects on achievement that extend on into second or third grade, that children from disadvantaged environments can be performing at grade level in basic skills of reading and arithmetic, but only under one condition, and that is that they have been taught something that materially helps them in learning these subjects. These results are fairly new. There are three studies of substantial size in addition to the small one we carried out at Illinois, which demonstrate

the value of pre-school instruction in scholastic skills. One is by DiLorenzo of the Department of Education of the State of New York, another is by Edsel Erikson of Western Michigan University--the most thorough study of our approach to pre-school education that has been carried out so far--third is by Werkart in Ypsilanti, Michigan. I might mention that one real advantage that's accrued to us from having a controversial program is that other people do our research for us and we don't even have to suggest it, let alone pay for it. They usually set out to prove that our program is no good and so we get a lot of research done this way. The outcomes of these studies are much the same. You get large immediate gains in comparison to control groups, in I.Q. and in the kinds of achievement you can measure at the pre-school level. By the time the children start into first grade the I.Q. advantages have largely disappeared so that results begin to look discouraging. By the end of first grade and on into second grade differences in achievement begin to emerge. Thus, we have no evidence that the kinds of things we have taught make any lasting impression upon I.Q. This was never their intention anyway. Seemingly, whatever we teach is relevant to I.Q. performance only at the time and doesn't have any persisting value. But in areas of basic school achievement, direct instruction in useful skills can make a difference. That's not my topic for today. But I simply want to call to your attention that there is evidence that it counts and I would hate to see a deployment of educational resources into baby education or into parent education that was done at the expense of teaching kids in school and trying to improve instruction there so that children really learn those school skills without which they can't possibly get anywhere in school.

Having said that I now want to turn to the question of what you can do beyond teaching the basic scholastic skills of reading, arithmetic and what we loosely call concepts--that is, knowing what a lot of words mean and the kinds of relationships they imply. In short, I want to turn to the question of teaching thinking.

I don't know how to define thinking but one negative statement about it: if you can describe the behavior that you're teaching then you're not teaching thinking. Thinking is a kind of residual. If you can describe accurately the behavior that you are trying to teach then you are at best teaching some kind of mechanical process. Say you want to teach long division. You can describe the behavior that you want the kid to execute in quite explicit detail. It therefore lends itself nicely to teaching and the great advances that have been made in teaching have been made when people have taken some kind of performance that had previously not been described behaviorally very well and done so, so that then it became teachable. Another way of saying it is--if you can show the person how to do it, it's not thinking. You see, the advances in teaching little kids to read have largely come about through finding ways to show them how to do it. Previously, you could get them to memorize words and then maybe as they went ahead and rattled off those words, sooner or later they would learn how to read new words. But with some attention to the engineering of the task you can show them how to figure out what a word is and then maybe as they went ahead and rattled off those words, sooner or later they would learn how to read new words. But with some attention to the engineering of the task you can show them how to figure out what a word is and then you

have taught them how to read. Then it no longer requires the kind of thinking that it did. The kinds of things we loosely refer to as thinking are solving problems, reasoning, drawing deductive and inductive inferences, and creativity in the sense of generating new ideas. In all of these you may be able to define what the performance is you expect of the child--what you expect him to accomplish--but you can't define how to do it. And this leaves the behavioral engineer at somewhat of a loss for tools. His most powerful tool, which is that of describing explicitly the behavior he wants and setting up some way to get there from where the kid is by reinforcing steps in the right direction, is lost because he doesn't know what the behavior is he's trying to reinforce. As I see it there are two ways that one can go about methodically trying to teach thinking without knowing what the behavior is that you want. Both are inadequate, but they are the only ways I know of. One of these is to forget about thinking altogether and simply try to teach the children other things which may enhance the quality of their interaction with the environment in such a way that they'll learn everything better and then you hope that thinking will be included among the things that they learn better. For instance, one may teach kids to ask more questions and more different kinds of questions and teach them how to use questions for more different purposes. This in itself is not teaching thinking, but it doesn't sound too unreasonable to suppose that if you could get a kid to ask more and better questions it would lead in the long run to his having more experiences that would enhance his learning and thinking.

That's one of the ways of doing it and our current work is pursuing several tactics along those lines. We have what we call a communications skills program that's concerned with three aspects of language use: instruction-following, which doesn't have much to do with thinking at all. It is just a practical thing for kids to know in school--how to follow different kinds of instructions of increasing complexity. Then there is instruction giving, which does seem as if it might have some more relevance to thinking. A typical instruction-giving task is one where the children have a diagram of some kind and they instruct the teacher in how to reproduce it; that is, they tell her verbally what to do step by step so that she can reproduce that picture. The kids can work their way up to becoming quite proficient in giving instructions for a picture that has a triangle in the upper left-hand corner and a circle at the bottom and a line connecting them and, in the middle of the line, is a square with a line running off in the other two directions. They can get in all of those details so that the teacher can follow the directions. This communication skill seems as if it might be helpful for children's learning to think in that it gives them greater proficiency in specifying what they would like someone else to do, instead of expressing a general wish or just letting people know that they're uneasy about something. It helps them to be very specific about what they want. The third communication skill is question asking, where again we strive to help the children learn to be very specific about getting the information that they need and want.

The premise that we're operating on here, in advocating this kind of instruction, is one drawn from Piaget who, in his early days before he became carried away by his own formalism, used to talk a lot about

how important social interaction was for learning to think. For the child to acquire points of view other than his own (which Piaget saw as the basis for decentered thinking), Piaget held that it took "friction" of one mind with another. More broadly, Piaget sees intellectual development as occurring through an experimental process as the child acts on the environment, something happens and the child's cognitive structure changes as a result of it. The application of this idea is obvious for fiddling around with blocks, but when you're in the social environment, how do you experiment? Well, one of the ways you can do it is by telling people something and seeing what happens as a result of your instructions; another is by asking questions. These are analogous to physical manipulation and so what we are trying to do by developing these skills is to turn kids into better experimenters with the social environment. The premise is that if they can do more things in the social environment, act on people in more precise and various ways, they are going to learn more as a result of it. Thus, we draw from Piaget a theoretical justification for a very non-Piagetian sort of teaching.

The other way of trying to get at the teaching of thinking is through simply trying to isolate more different kinds of thinking problems--more kinds of thinking performance--and operating on them separately. Here we come down to the most primitive kind of teaching that there is, which is straight practice. You don't know how to teach it, so you just make people practice. I'll submit that this is the only way that anybody tries to teach thinking. All that the more glamorous thinking programs are, if you examine them, are fancy types of practice. No one is ever shown how to think; one is only given practice in thinking. I am willing to acknowledge that that is where we are. All we know how to do is give practice. You can make it fun-practice. You can make it exciting-practice. But in the end it is just practice. You try to give children practice on easy things and then you work your way up to hard things. Somehow or other you hope the kids stay with you and can go from easy to difficult. You don't know how they get there. You just observe that they do.

How can you improve upon this crude procedure? Well, one way is to give practice on more different kinds of sub-skills of thinking. And I'll point out what some of these are that we have been working at. These are listed in no particular order but give you some sense of the kinds of things we see as lower-level kinds of performance. Here's a relevance task: relevance is very important in thinking. You have to know whether one statement is relevant to an issue or not to think rationally about it. But here, we've tried to strip it down to the simplest kind of relevance task, in which the child asks the teacher a question. She gives him an answer and then he has to decide whether or not she answered his question, not whether it was answered right or wrong, but whether it was answered at all. That proves to be a very tough thing, not only for five-year-olds but for second-greaders--even fairly bright second-graders--to handle. We don't know how to teach anybody to decide whether something is relevant or not, so the only thing to do is try to get down to an easy enough form of the problem that the kids can already do it, and then work our way up by degrees. Well, one way to do it is to give the kids glaringly irrelevant answers. If they ask you, "What's your name?", you say, "Today is Tuesday," or something like that, so that there is no resemblance between the question and the answer. Then ask, "Did I answer your question?" so that they can say, "No."

The other way is to separate out the sources of difficulty. Where kids run into real problems on the relevance task is in confusing rightness and wrongness with answers and non-answers to questions. If they ask you, "What month is this?", and you say, "September," and they know it's not September, they're just not willing to admit that you have answered their question because your answer was wrong. The difficulty can be avoided by always giving them true statements. That's another way to simplify the task for the time being. We start out with answers that are radically irrelevant but always true statements, so that they can't quarrel with the truth of it. Now they only have to judge whether you have answered the question or not. You can get down to a five-year-pld's level with a task like that, and then it's a simple matter of just working your way up, giving answers that are less obviously irrelevant until the children are fairly finely tuned in on whether you have precisely answered their question. After the children have reached the point of judging an answer to their question, they can be introduced to the confusing business of deciding whether the answer was true or false.

Another way we protect children from the confusion between correctness and relevance is to have them ask questions about some object that is held behind a book. Once they ask about the thing, e.g., "What color is it?", they are told, "It's orange. Did I answer your question?" They don't know whether they've been rightly or wrongly answered because they don't know what the thing is, but they can decide whether I've answered the question. Then they are shown it's white and asked, "Did I answer your question? Yes, I did. Did I answer it right? No, I didn't." And so on.

I've dwelt on this problem because it is a nice one for illustrating the strategy of starting out with some kind of behavior that looks like it's important but one that's already beyond the typical five-year-old and trying to find some way to get that same performance simplified to where he is actually able to do it at age five, working your way up through a hierarchy of difficulty. The same strategy applies to detecting incongruities--such things as missing parts, wrong parts, things that are the wrong size, and so on. Here, the problem can get endlessly subtle. But, on the other hand, you can usually get down to a point where the incongruity is so obvious that the five-year-old or the four-year-old can spot it right off the bat. You show a chicken with a square egg and maybe rural children will spot it, but city kids just see a chicken with a block beside her and there is no incongruity there for them. But show them a picture of a man with windows where his eyes should be and they get it right away and, furthermore, can tell you what's wrong with him. So you work up again through other levels of difficulty.

Some of the other things we get into are defining solution sets where there is a problem that can have many solutions. For instance, there are all kinds of things you could use to hold down pieces of paper, but instead of naming all of them, you name the attribute they have. Well, what do they all have to be? They all have to be heavy. They all have to be dry rather than wet things.

Now, rather than go on further with them, I want to indicate how, short of having a well-trained teacher with a good set of tasks to teach

of this sort, one might go about involving parents in this kind of work in a realistic way. It so happens that one of the angles that we have been working on is the creation of thinking stories. And, as I see it, stories provide a good medium for working at these kinds of thinking tasks through parents. In almost any sort of parent work, I'm sure, one of the things you would want the parents to do would be to read stories to their children. And this can often be a pretty passive sort of activity for the child, where he sits and listens. In fact, it seems that the children we have worked with are thoroughly conditioned to just sit and listen to a story and to take everything as given and not react to anything. I can illustrate this best by reading you one thinking story, which is the most total failure of any that we have come up with so far. This was a story designed to give rise to questions. The idea was to present a story in which nothing definite enough was told that the kids would know anything at all, and so that they would ask questions to find out what happened. Here is the story. It's very short.

"One day Ferdie and Portia had a great adventure. They went some place. When they were there, something happened. When they got home, Ferdie said, 'Boy, that was exciting! I'll never forget that as long as I live.'"

"'I won't either,' said Portia. 'Was I ever scared!'"

"That's the end of the story. Wasn't that an exciting story"! And the kids sit there and say, "No." And you're left helplessly coaxing them: "Don't you want to ask any questions about it?" It doesn't occur to them that there would be any use in asking questions. The story is over. Daddy read them the story. "He doesn't know any more about it than I do," I think is their assumption at this point. So to overcome this passivity, which can't possibly be conducive to learning in any way, try to build in stories that get the kids to respond in some fashion all the way through. And thinking stories, with the exception of this one which failed totally, seem to do this. The kids do participate more actively in the story. Stories for children have typically been almost exclusively romance, but children do have intellectual interests and do take to stories in which the appeal is an intellectual appeal. Usually the appeal is humorous, but it is intellectual humor.

Here's another story. This gets at what we call educated guessing. We set up situations in which there is no known answer, in which there is not going to be an answer, so the children must guess; but some guesses are better than other guesses. This is the type of problem we want them to recognize--that some guesses are better than other guesses even though you don't know the answer

"One day, when Ferdie and Portia were watching TV, they saw something run across the floor and run under the door. It was going so fast they didn't see what it was, and when they opened the door to look it was gone."

"'I wonder what that was that ran under the door,' said Portia."

"'I don't know,' said Ferdie. 'Maybe it was a dog.'"

"Was that a good guess?", you stop and ask the kids, and discuss that for a moment. "Could it have been a dog? Why not?" This is obvious enough that they are likely to come up with the notion that it's too big.

"'Maybe it was a little fish.', said Portia."

And again you question them on this.

"'No.', said Ferdie. 'I think it was a bird.'"

"Portia then said, 'I think it was a worm.'"

In each case you question them. Was that a good guess? What could it have been? And then you open it up and the kids discuss what it could have been. And the story ends:

"Well, Portia and Ferdie never found out for sure what it was because they never saw it again. But they decided that it had to be something big and slow. Do you think they're right?"

That last gets us into another type of task defining the solution set. You see, Ferdie and Portia defined the solution set as consisting of objects that are big and slow, whereas, of course, it had to be objects that are little and fast.

Now, stories like this could be handled by teachers. The story carries most of the load so it could also be handled by parents. All it requires is that the parent be able to read well enough to put a story across like this and the stories could pretty much program the question asking insofar as it's needed. What you do is begin by a lot of pulling things out of the kids, but then you get into a story pattern where it goes on and on and the kids are picking up more of it so that you no longer have to pull it out of them. It starts to come more easily. I can illustrate that with a story which illustrates several different things in this area of thinking tasks. This one's called Mutatis Mutandis.

"Mr. Mutatis liked to change things. Every time he got something he changed it into something else. One day he got a new TV set. Get a picture in your mind of his big new TV set. Can you see a TV set in your mind?"

"'This is a fine TV.'", Mr. Mutatis said. "'But I think I'll change it a little bit.'"

"First, he took the top of it off. Can you picture in your mind what it looked like with no top on? Then he took all the insides out and threw them away. Can you picture what it looks like with no top on and nothing inside it? Then he put wheels on it, and then he put a handle in front to pull it with. Can you picture that--a TV set with no top on and nothing inside it and with wheels on it and a handle in front? Does it look like a TV any more? What does it look like?"

Now that's--you know the answer? Well, it doesn't look like a TV anyway. And what do people say to that? What answer? (Mrs. Ann Hughes)*

They said wagon before I could finish.

Dr. Bereiter:

Before you got through they all say wagon. O.K. Children are better at this than adults, I think, if the words are all within their repertoire. I really do think so from my observations. They are better at it--at following these imagery tales. Well, this goes on now you see. I won't bother reading you all the examples, but just enough to indicate the pattern that is established.

"One day, Mr. Mutatis got a new lamp that looked like this"--and you show them a desk-type lamp, you know, with a straight narrow stem. "Mr. Mutatis liked his new lamp, but do you think he could leave it the way it was? 'No,' he says, 'I think I'll change it a little bit.'" Now, in the other run-throughs of this, you let them feed the line in. What do you think he said? "'I think I'll change it a little bit.'" It has a refrain, you see.

This is another easy one: He took out the light bulb, and he threw away the lamp shade. Get a picture in your mind of the lamp. And then he got some sticks, and he fastened them to the top of the lamp, and then he got a bunch of green leaves, and he stuck them all over on the sticks--so it doesn't look like a lamp any more. The story goes on and on through a table that by various progressions is converted to a bed, a truck that turns into a bus, a chair that turns into a stool, and a pot where you throw away the pot and keep the lid and take the handle off and turn it upside down--and what do you have then?

What I mean to show here is that at first you have to pull everything out of the children, but later you get the pattern established. It's like the nursery rhymes where the kids learn the refrain. They know what the problem is going to be, and they are alerted for it so they know this guy is always going to change something, and that they're going to have to follow it.

You'll notice also that this story has a lot to do with imagery. This is about as far as we go in trying to get at thinking processes. What we're trying to develop is visual imagery. You have no possible way of assessing whether or not a child actually has it, and, of course, a psychologist may well ask how we know there even is such a thing at all. But people can report it, and one of the things people report is that they solve a lot of reasoning problems by manipulating imagery. There is even evidence that successful problem-solvers manipulate images more than unsuccessful ones. So whether it exists or not, it seems to be worth trying to teach it. And this is a way of going at it. You work with a visual

*Mrs. Hughes, from Miami, is a writer for Open Court Publishers. She and Dr. Bereiter are collaborating on a new kindergarten program to be ready in September, 1970.

image, and you change that image and keep working with the kids and getting them to try to see at each stage what change has been brought about and then spring the question on them at the end--what does it look like now? And based on the assumption that the kids can't reason through with that much information, we conclude that if they can do it, they must be following it with imagery because there are too many steps for them to process accurately just be straight reasoning.

Another type of thinking (this is a lower-level thinking skill, a matter of following sequences and recognizing necessary sequences) is illustrated in Skippy at the Bath or Ten Steps to Clean Living, as Valerie Anderson who is the author of this story subtitles it. We'd like to figure a way to take only five ways to clean living, because ten steps make a difficult story, but we can write some other stories that have fewer steps.

"Skippy forgot things sometimes. He tried very hard to remember everything, but he just couldn't. Do you ever forget things? Well, Skippy does too. Do you remember most things? So does Skippy. One day, Skippy's mother decided he was old enough to take a bath and get ready for bed all by himself. There were ten things for Skippy to remember. He had to plug the tub, turn on the water, turn off the water, take off his clothes, (you pantomime all this) get into the tub, scrub with soap, wash off with a wash cloth, pull the plug and get out, use his towel and put on his pajamas."

And then you rehearse these with the kids. They pantomime and they rehearse until they've pretty much got the idea of what the things are, and then you launch into the story: "Let's see if Skippy will remember everything as well as you did. Monday night Skippy tried very hard to remember everything. He plugged up the tub, turned on the water, took off his clothes, got into the tub, scrubbed with soap, rinsed with the wash cloth, pulled the plug out, used his towel, put on his pajamas. Do you think he remembered everything?"

Audience:

He forgot to turn off the water.

Dr. Bereiter:

Pretty sharp. If the children don't volunteer that he forgot to turn off the water, it says here, you just go on with the story without revealing what he forgot because then we put in a clue--"He was just about to tell his mother that he remembered everything when he looked and saw a lot of water running out of the top of the bath tub. What did he forget to do?"

Skippy goes all through the week on this so it is far too long for one sitting with the kids, but again the pattern builds up. They know by now on Tuesday night Skippy's going to forget something else, and it will have some other consequence. If they can remember what he missed, then you can ask them what they think is going to happen as a result of it. On Tuesday he ends up pretty dirty because he forgot to scrub with soap. Wednesday night he ended up pretty soapy because he forgot to rinse the soap off. And then Thursday night he ends up wet, and so on.

Stories of this kind are one way that thinking skills could be introduced into early education via the parents. I have to close by saying that I wouldn't run out and sell all my stock in reading and arithmetic at this point because although it's fairly easy to design thinking tasks that seem attractive--they have much more adult appeal and in fact more child appeal than some of the routine kinds of learning--I must remind you that there is no demonstration as yet that you can teach anybody to think. You can clearly get kids so that they are better at each of these separate kinds of performance. There is no question of that. And there is a lot of other research that shows if you isolate something that you call creativity, performance on a certain creativity task, and try to teach that, they'll get better at that as well. But there doesn't seem to be much transfer from one kind of task to another. At this point I think all you can go on is face validity. Does the thing you're teaching look like it's a worthwhile kind of thinking? If so, then it may be worth doing even if it doesn't transfer to much of anything else. The more fundamental you get, the more in doubt it is. You see the imagery task where you are following in imagery the changes on these objects. That's great, if indeed it transfers, if children can later use it in reasoning. If it doesn't, then you've just played a funny game with them and they have enjoyed it. On the other hand, if you can get them up to where they can tell whether or not you have answered their question and can handle rather subtle deviations from a straightforward answer, this has a good deal of face validity. All you'd have to insure was that you'd proved that they could do it in response to different answers in different areas, because this in itself is a useful skill. You see the imagery in itself is nothing unless the kid can apply it elsewhere, whereas the ability to tell whether a question has been answered has some value in and of itself. So I think here we can make a distinction and favor teaching some of these.

In the meantime I would strongly advocate giving early education a strong thinking emphasis if for no other reason than that the lack of evidence about the value of thinking tasks is no more total than the lack of evidence about the value of existing early childhood education activities. And children do like them. They generate great enthusiasm. There is much more enthusiasm for these than for the usual run of nursery-school recited stories. Another reason I favor thinking stories is that I believe they will be more attractive to boys. By and large "kiddie lit." is a female construction, constructed by women for girls. Boys drag along with it and do listen to it, but I think the kind of stories I've illustrated would have a little more masculine appeal. And, of course, it is the boys in all social strata and in all groups in our country who seem to be getting the short end of the stick in their early school years.

Discussion from Panelists.

Dr. Schaefer:

I thought that was a wonderful specification of types of verbal interaction that parents or teachers might use with children that might be useful. I wondered why Professor Bereiter called it thinking. It seems to me it could be called how to collect information, how to process information, how to communicate information; or it might be called language or communication; and, I suppose, that's related to thinking. I would like to ask Professor Bereiter how this relates to Marion Blankenship's type of verbal interaction with children.

Dr. Bereiter:

The relation to Marion Blankenship's work is pretty close. We've gotten a lot of ideas of the kinds of thinking problems to deal with from her, though our work differs from hers in a number of ways. First, we're trying to design activities that can be used for groups with one teacher for a whole group, whereas, she's working with individual tutoring. The other main difference is that she has largely worked through the teacher firing questions at the kids. It's not a promiscuous bombardment of questions. A highly-trained teacher is asking very pointed questions. And we're trying, rather, to set up tasks in which the kids are seeking information in one fashion or another and where the structure of the task elicits the response from the children, rather than its relying heavily upon the teacher's asking of questions. So I think, if the kids could become too dependent upon the leading influence of the teacher in always doing the questioning for them, sooner or later they have to do the questioning of themselves by themselves.

Dr. Homme:

I am delighted to see somebody of Professor Bereiter's competence dealing with this matter. Probably thirty years ago Skinner suggested you could teach thinking, and there are still plenty of people around who think you can't. There was an important statement made by Dr. Bereiter that I think we ought to think about; and that was one of his first statements that there have been accomplishments already; and our society has largely ignored them. For example, there were lots of solutions to the pollution problem thirty years ago, which people were advocating at the time and getting stones thrown at them.

Dr. Bereiter talked about the mere fact of practice in thinking--giving practice in thinking. I think there is a whole area of practicing the unpracticable which Dr. Bereiter has opened up here; and evidence for the efficacy of practicing the unpracticable is appearing here and there. For example, there's a recent article in the Journal of Experimental Analysis of Behavior which relates what happens when, in effect, you tell a porpoise, "Do something you haven't done before." And he does it, by God. That is to say this fellow is teaching creativity to porpoises. They execute behaviors that no one ever saw in a porpoise before. In the same way, I think Dr. Bereiter might agree you might see some thinking you never saw before, which our world could use lots of as you know. Well, I just want to say, Carl, that I like you.

Dr. Bereiter:

That warms my heart, and I like you, too.

Dr. Haywood:

And after the love-in, we'll go on.

Dr. Merriam:

Dr. White, would you like a turn?

Dr. White:

There is an awfully lot that goes on in the fields of early education and psychology that I don't happen to think is worth the money that's put into it or the effort. And I think what Carl Bereiter does is an exception to that. His first nice study of the fifteen children that he worked with at the University of Illinois seemed to me to be one of the few well-executed studies in early compensatory education. And I have a lot to do with traditionalists in the field and they kept saying, "That Bereiter is a mean fellow, isn't he? We're not interested in doing any of the things that he has been talking about." And I keep coming back to them and saying, "Well, look, are you interested in the affective surround of what a person does more than you are in whether or not it does good for the kid you're trying to do good for?" And I have been over this argument thousands of times. He's neutralized the opponents who say that there are all sorts of horrendous epiphenomena of side effects of that original program of his; but you still get the same reluctance to look at what is first of importance in that issue which is--what works for kids?--what's reproducible and what works?

But setting that one aside, I liked what he's talking about today, too. It is, in my thinking, very high quality. I'd like to touch on two points. First of all, this business of the thinking stories where something quick ran out underneath the door reminded me immediately of what excellent mothers seem to do with their three-year-olds and four-year-olds. They make a systematic guided use of the absurd, which is what's involved here; and that brings in mind-stretching; that brings in fun; and it's interesting. And I am hoping, by carefully looking at what these special mothers do, we will find a few more things so that you don't have to stretch the ingenuity of the creative minds in, say, a Bereiter operation to find things on which to base stories.

The second thing is that the remark about the underplaying recently of the role of social interaction as a catalytic kind of situation for the development of thinking is something that I'm very interested in and endorse. A lot of the people who argue most vigorously against Carl, I think, would be tickled pink to hear him say that there is some relevance to the human qualities of life for the thinking process in children. They seem to think that he'd like to stick a child off by himself somewhere in a closet and use tape recorders and train the brain and forget about the rest of him. But in Piaget's original work, as I interpret it, there is an important other dimension around the business of the social catalyst. It is not only that in the process of social exchange the child goes from egocentric to socialized thought, but there's a pre-condition. He's got to have the tendency, the motive--he's got to care enough and be secure enough to want to influence, to persuade and to communicate with another person. Now, Piaget doesn't say what really is the source of that motive; but he says that's what makes for the shift to this more mature form of thinking at around seven or eight. And I think that's an example of the kind of prerequisite development which probably we're going to have to program for in the years before six or seven.

Questions from the Audience.

Question:

Say a child has gone through the steps of filling the bathtub, etc. and simply doesn't quite catch on. He can't discover which is the missing element. Would you then reinforce this with supplying him the visual imagery that he couldn't develop himself so that he would feel a success with this task, or would you let it alone for a while and take him back to a task that doesn't require quite as much thinking and come back to this later?

Dr. Bereiter:

If the kids couldn't handle it, and it's a difficult one, what we would try to do would be to retain the same structure of the task, but to make it easier by using something that has fewer steps or, as you suggest, provide them with visual props where each of the steps is pictured so that he can tick them off. Yes, try to keep the same task but try to get it down to where he can handle it and then remove the props and expand the number of steps.

Quesion:

Dr. Bereiter, you said at the beginning of your talk that you wanted to get children to ask questions more specifically. It seems to me that children ask pretty specific questions. They come up and Johnny says, "Daddy, where did I come from?" What do you mean by your statement, "more specific questions?"

Dr. Bereiter:

Well, I can illustrate it. You can set up a finding task where the kids have to find, say, which of a number of objects has the penny under it by asking you questions. Here, there are very specific questions like, "Is it under the book?" Now, that kind of question is specific but not very useful. What you want them to do is get to specific questions that chop off more information each time like, "Is it under something blue?," if there are a number of blue things, as against just asking, "Where is it?," which is just a big sweeping question.

Question:

What did you mean when you said that the boy got the short end of the stick.

Dr. Bereiter:

Merely that it seems that most activities in early childhood education are more appealing to girls than boys; and, of course, in school boys have more learning difficulties. There are more reading failures among males. More of them end up in what we call in Toronto "opportunity classes." Across the board, boys suffer more; and one

of the conjectures is that they do so partly because the school is run by women and the general appeal of what's offered.

Question:

Professor Bereiter, I have two questions. First, I wonder if there is any way to determine how the child perceives the original direction of a figure on paper. I am thinking in terms of the Bender-Gestalt type of things, and I wonder if the child cannot give the direction, or if the child is giving the direction in the way he perceives the pattern on the paper?

Dr. Bereiter:

We have worked quite a bit with that particular task of having the kids give directions for reproducing a design. Of course, it works up from very simple levels where it's like, "Draw a square." That's all there is to it. The kids can always name the separate ingredients of the picture. They run into trouble, of course, in describing the relationships, in specifying the relationships between the objects in it. And even in the most complex designs, the kids don't have any trouble seeing that something has gone wrong. You know, if the teacher does it differently from the design, they can spot this so it's purely a problem of formulating the instruction in this case, I think. At any rate, you probably could get up to designs that were complex enough that the kids couldn't tell whether it was a good copy or not. But they run into difficulty in giving directions at a level far beneath that.

Question:

Do the children reproduce the design first, before they give the directions?

Dr. Bereiter:

No, because you can get them to where they're prescribing actions for the teacher that they couldn't carry out themselves.

Question:

Do they ever draw the changes, even though they might be very simple kinds and maybe not look like anything to an adult; but maybe it would look like the change to the child?

Dr. Bereiter:

Yes, we do quite a bit of that. In fact, drawing is one of the basic tasks; and we do things like project with an overhead projector onto a chalkboard an incomplete figure, a house with a door missing, say. The kid who spots what's wrong, instead of just saying, "What's wrong?," goes up and draws a door.

Question:

Have these stories ever been reproduced or published?

Dr. Bereiter:

No, they're just in preparation. They are just in manuscript form now. They're going to be published.

Question:

My second question is, do you attempt to measure a change in their thinking by gain scores or anything; or don't you attempt to measure it at all?

Dr. Bereiter:

Well, no. We have quite a criterion problem on that at the present time because we can measure effects on gross indicators of intellectual ability, such as I.Q. tests or performance on Piaget tasks; but those don't tell us very much about the effect of these specific things. So, about all we can go by is the level that a kid reaches on a specific thinking task. We are left in ignorance as to the transfer value of these things at the present time. However, there is clearly a need to go into a research phase here where we explore this. But we've got to get the tasks that work first where we can show demonstrable learning within the task itself.

Question:

Did I understand you to say that if a child retells a story and he quits that's a low level of thinking? Do you consider that a low level of thinking?

Dr. Bereiter:

If he just retells the story and quits.

Question:

In sequence?

Dr. Bereiter:

In sequence, yes. We're treating that as just a kind of preliminary to the thinking. That's to establish that he's got it stuck in his memory some place. So then he can think with it.

Question:

So then you're saying we should extend his ability to think by, perhaps, giving him part of the story and letting him finish it?

Dr. Bereiter:

That's one way. That's branching off where you simply start a story and let him finish it. This is one kind of task. We tend to steer away from that because that is throwing the whole burden of creativity on them. That's saying write a story. We try to go down to a simpler task such as one where they're singing a song that has a certain pattern like a rhyming pattern. "Did you ever see a mouse eat a house?," and this kind of thing. Once they've gotten the pattern from instances you have given them, then let them go on and generate more things with their own words. Where the amount of invention is rather small and the amount of pre-structuring is rather large, then move from there to where they are adding more and more of their own construction to it.

Question:

Do you think we will be able to get any of the types of stories you had this afternoon any time?

Dr. Bereiter:

They're supposed to be out next fall sometime. The reason I was going through these was to suggest the general line of approach to this because I'd like to see you make up your own stories as well. We have tried to produce enough instances so that parents and teachers could go on and embroider on these basic patterns.

Final Comments by Dr. Carl Haywood.

One issue that has been skirted during the whole conference that has come up just lightly, occasionally, has, I think, been dealt with in Dr. Bereiter's remarks in somewhat greater depth. And that is the general question of the use of a highly-structured approach in pre-school education. Let me just review a little history for you. I think that the misinterpreters of John Dewey were responsible for the unstructured approach to pre-school education; and their particular misinterpretation was reinforced by Carl Rogers, his general philosophy, some of which is also a misinterpretation. The general feeling has been, particularly in the 1920s and 30s that all you need to do to get adequate intellectual and personality development in children is to remove the obstacles to it. Well, that helps. It, obviously, helps to remove the impediments to intellectual and personality growth. It turns out that one can do a great deal more than that. You've heard me say in conversation hour, and perhaps in the halls and at other times, it simply isn't enough to expose the child to sunshine, good temperature and water him occasionally. One thing that seems to come out in all of the successful pre-school education programs is a fairly high degree of structure in the curriculum. The extent of a success that one will enjoy with a structured approach depends heavily upon the ingenuity of the teacher. One possible limitation that concerns me from my research with mentally retarded children is that I find it difficult to imagine doing some of the training

exercises that Dr. Bereiter was talking about with some of the mentally retarded children that I work with. I am quite sure, though, that it would be simply a matter of starting at a somewhat more elementary level and working toward the kinds of events and manipulations that were described today, and that we would actually get there. At the moment, though, it sounds like the responsiveness that one expects of secure advantaged children.

I just hope, and I realize I will get some opposition on this, that this Conference will mark the demise of the unstructured approach to pre-school education. Unguided play must be replaced with teaching formal structures. We've learned in the past few years in this great, unprecedented surge of support, that the nation has given us for studying child development and for studying the educational process, if nothing else that children are capable of far, far more than we've ever given them credit for. So I'm suggesting, I think, along with Dr. Bereiter, that it's time we took advantage of those capabilities and enhanced them.

I was interested, also, in the mention of the fact that we seem to be stuck with I.Q. as a criterion variable, although none of us is satisfied with it. I just want to be a broken record and to say what those of you who know me have heard me say so many times, that an I.Q. score is a predictor variable, not a criterion variable, that it's constructed, in the first place, to predict how well children are going to do in an academic situation, that I am unimpressed with either a demonstration that an experimental education program raised the I.Q. or that it failed to do so. The proper criterion for evaluating the effects of an educational intervention on learning is school achievement; or, if you're trying to teach something else, it is whatever you're trying to teach. It's not a score on another predictor.

It reminds me of the situation that occurred once at Peabody, where we require that the Graduate Record Examination be taken before a person is admitted to the graduate school. Well, we managed to get somebody who got admitted to the graduate school through clerical error, without having had the Graduate Record Examination. The big hang-up came in the office of the Graduate Dean. After all the courses had been completed, the doctoral preliminary examination passed, etc., how could we let this person get a Ph.D? He hadn't taken the G.R.E. My comment was simply, "Never use a predictor variable when you've got criterion information available."

I was very, very interested in another dimension of Dr. Bereiter's particular approach, which is that he uses perceptual cognitive incongruity. That's my particular neologism to maintain children's interest in learning tasks. I think this is a very powerful technique. Joe Hunt and I used to sit around and be amused with children that we would see at the University of Illinois and the developmental phenomenon that occurs around incongruity. There is a time, as Joe loves to point out, when young children are very much upset by it. One of our favorite techniques is to say nursery rhymes and then to say them wrong. For example, one of my children is named Christen; and I will say to her,

"Hey, diddle, diddle, the cat and the fiddle, the cow jumped over the moon. The little dog laughed to see such sport, and the dish ran away with the Christen." And when she was two, she would just get red in the face and say, "Daddy, say it right!" But by the time she was three or four, somewhere along in there, it laid her out in the aisles. She was absolutely delighted to have me sneak in the wrong word. I think it gave her a feeling of superiority to be able to say that's not right and I know it's not right. It also is an amusing kind of game, the motivational basis for which, I think, is that there is an optimal mis-match between the information that is coming in through the senses and that which has already been stored, so that the discrepancy is just large enough to be titillating so that it motivates continued interest in the problem.

Dr. White:

Can I reinforce that for a minute? A good friend of mine is deeply involved in this Sesame Street program; and among all the high-falutin things that they put into that program, those of you who are familiar with it know that they brought in a"Buddy and Jim"series, with some misgivings. The"Buddy and Jim"collection features two adults who are the world's most stupid human beings. They can't do anything right. They hit a balloon with a nail, and so forth. And they felt they didn't have a good rational basis for putting it into a didactic kind of system. But they find over and over again it's the single most enjoyed segment by the children. And this notion of the feeling of absurdness and superiority that is generated in the children reminds you of that old fellow, Alfred Adler. Apparently, he was not totally wrong.

Dr. Haywood:

I think jokes are another excellent technique. My children use them on me to train me, and sometimes they are very difficult to bear. I remember the first joke that any of my children ever told me; and the oldest one is entering college in the fall, so it has been awhile since we had our first unbearable joke. When he was about three-and-a-half or four, or something like that, he came dashing into the house and demanded with absolutely serious face, "Daddy, are you a member of the stomach club?" "No." "Well, turn in your belly button." Well, I just want to suggest then that jokes are an excellent technique, not only for language manipulation,(they do permit the child to turn words around and look at them from all sorts of angles) but also for thinking training. Also, there are some excellent word games that can be used for the purposes.

THE CONFERENCE IN PERSPECTIVE: NEW DIRECTIONS

Presentation Made at Session V, Friday Afternoon.

Chairman: Dr. William R. Blount, Research Assistant Professor,
INSTITUTE III: Exceptional Children and Adults

Speaker: Dr. Carl Haywood

It is my job to summarize this Conference and to tell you, from the vantage point of what I wish were "revealed truth," where we ought to go from here. As you are aware, the summary of the Conference has been taking place after each session; and, therefore, after a few comments, which I feel most pertinent, I shall claim the speaker's privilege of concentrating on my own research.

We have talked a good deal at this Conference about the responsibility for pre-school education. First, let us agree not to call the area "pre-school education." Let us call it "early childhood education" or "education of young children." By so doing, we might be able to suggest that schools are not without responsibility for education before the first grade. When we refer to the area as "pre-school education," we imply that it is not part of the school system. In fact, sometimes it doesn't seem to be part of education. I would suggest we get away from that.

The general conclusion seems to be that education is everybody's responsibility. It is the responsibility of the teacher, the parents, the government and the child. Isn't that a refreshing concept--that the child himself has some responsibility for learning? But in all the enthusiasm for shifting the responsibility to others, let us not have a situation in which professional educators abdicate their responsibility for leadership in this process. It has been suggested repeatedly in this Conference that parents can and should be brought into the educational process. That's a quite, quite different suggestion than to suggest that formal education be turned over to parents. Being both a parent and an educator, I'd like to play both sides of the street. Can't we both have and find our legitimate places in the process?

One thing that has aided the generation of enthusiasm for involving parents in education is the change that has occurred in the structure of the family in the United States. Twenty years ago, I heard theologians arguing that parents had abdicated their responsibilities for moral and ethical training. Today, I hear educators saying that parents have abdicated their responsibilities in the academic education of children, which were never as clear, at least in the last one or two hundred years, as were the parents' responsibilities for moral and ethical training. Let us, as educators, not abdicate our responsibility for exerting vigorous leadership in the educational process as we bring in other people.

I have perceived throughout these meetings, as I'm sure you have, great excitement with the potential value of early childhood education. The emphasis should be on the word "potential," as well as on the word "value," because we are still looking about, casting about almost

frantically, for appropriate methods, materials and approaches to early childhood education. This widespread hunger for adequate methods and materials is both encouraging and discouraging. It is encouraging because people want to know what they are doing. It is discouraging because the degree of hunger that exists among all of us for adequate proved methods and materials makes us particularly susceptible and receptive to unproved methods and materials. I would just like to issue a warning about the kinds of enthusiasms that can develop out of the very appropriate hungers that we feel for methods and materials in early education programs. The temptation is to grasp anything that comes along, on the highly questionable assumption that it is probably better than what we are currently using, even if the new materials have not been adequately tested.

You have already heard Dr. Bereiter tell you that he is not prepared to throw out the entire educational system and start all over. I don't think we should either. We have amassed a very great deal of knowledge about children, child development, learning and teaching. It is reasonable to assume that not all of it is invalid.

A few comments about Project Head Start are in order. We have mentioned Head Start programs off and on during the last two days. It seems to me that we've spent the last five years both congratulating ourselves because we had the national courage to mount Project Head Start and excoriating ourselves because we have not done more with this unprecedented opportunity. I think that's a reasonable kind of ambivalence. It is a justified kind of ambivalence. Let me suggest that we do the following:

1. Let's stop trying to evaluate a nationwide early education effort which does not exist as a nationwide early education effort. Every Head Start project is different from every other Head Start project. It's nonsense to think that we can evaluate a nationwide program of totally different components, except in a kind of cost-efficiency way, which is quite, quite different from making a nationwide evaluation of the efficacy of pre-school intervention. That cannot be done except by evaluating individual programs using adequate criteria for evaluation. We might start that process by implementing my second suggestion.

2. Given the wide diversity in the kinds of programs, all of which are subsumed under the title "Project Head Start," let us identify the successful programs and then identify the unsuccessful programs. The latter will be somewhat more painful. Finally, we must search for the program components, the subject characteristics and the teacher characteristics that differentiate the successful from the unsuccessful. Head Start is not a failure; Head Start is not a success. It is all degrees of failure and all degrees of success, depending upon whose program and whose criteria we are talking about. So we have to take a fairly simple minded, nonexperimental, descriptive approach. That's enough about Head Start.

Finally, one suggestion I would offer to bolster the present situation would be to insist that government must increase its support of

educational research by a factor of at least five. In other words, the present public investment in educational research is no more than one-fifth of the need for investment in that area. We will stumble about; we will maintain our hunger for appropriate methods and materials until we have the kind of national enthusiasm, congressional enthusiasm and Presidential enthusiasm for research on children and research on the teaching and the learning process that we have had for the engineering feats that have managed to put Americans on the moon. I might even suggest that it would be almost as important.

Having said those things, I feel that it would be a good time to sit down; but I think instead of doing so, I shall take advantage of the opportunity presented by the fact that I have the microphone and tell you about some of my work.

I have slyly suggested from time to time during this Conference that what appear to be deficits in cognitive ability, particularly in disadvantaged children, and according to my own research program, particularly in the cultural-familial mentally retarded, instead, may very well be deficits in inclination to achieve or deficits in motivational systems.

My students and I have been engaged in a research program that is now seven years old, trying to identify some motivational components that interact with individual differences in ability; i.e. to produce variations in performance levels, both in laboratory situations and in classroom learning situations. One of the more promising of these motivational components, and one on which we have probably the most encouraging results, is a system that we have referred to by the cryptic name, the "motivation-hygiene construct." We borrowed this concept from industrial psychology. I was introduced to it by a book done by Frederick Herzberg and his associates in industrial psychology called The Motivation to Work (Herzberg, Mausner and Snyderman, 1959). Without going into a lot of history of the thing, let me just tell you that my students and I have turned the industrial psychology concept into a trait psychology concept and have studied the individual differences in it.

Being not quite as expansive as Caesar, we have divided the world into only two parts. Humanity can be divided into those individuals who derive their principal satisfactions from task achievement, from responsibility, from creativity, from challenge, from diversity or novelty and from beauty, as opposed to those individuals who seek to avoid dissatisfaction by concentrating their attention upon safety, comfort, security, money and the avoidance of effort, familiarity and practicality.

Panel Member:

Can you be both?

Dr. Haywood:

Yes, everybody is. In presenting this system, I am inclined to divide people up into two camps and to imply that there is no overlap. Actually, everyone must have some of both kinds of motivational systems in order to survive. It is the relative dominance of one kind of system over the other that permits us to measure individual differences.

This is not a hierarchical system of motivation in the Maslow, (1954), sense, because the motivation-hygiene construct does not suggest that the one kind of system has to be satisfied before the other one can be encountered. Maslow, as you will recall, suggests a need hierarchy in which the lower-level needs have to be satisfied before you get interested in the higher-level needs.

The safety, comfort, security, avoidance of effort kind of orientation we have called "task extrinsic." The satisfaction seeking through task achievement, responsibility, challenge, etc., we have called "task intrinsic." An individual who is chiefly characterized by the task-extrinsic system is referred to as one who is extrinsically motivated (EM). The other kind of individual who seeks his principal satisfactions through task achievement, and those factors related to it, is referred to as intrinsically motivated (IM). An IM person is motivated by factors that are intrinsic to the performance of a task, not intrinsic to himself. An EM person focuses upon task-extrinsic factors or factors that have nothing to do with the performance of a task itself, but have more to do with the context in which a task is performed.

Having gone through all that fancy explanation of that fancy system, let me tell you about some research, including some tests that we have devised for measuring individual differences in this kind of motivation. The first one we call the "Choice-Motivator Scale," which is simply twenty pairs of occupational titles and activities. The individual who is taking the test is asked to indicate for each item which of the two, A or B, he would rather be or do, assuming that he could be or do anything he wanted. After he has selected one or the other, he is asked why he would like to do that activity or be that person. If he says: "I would rather be a bus driver than a plumber because it's cleaner," that response is task extrinsic and is scored EM. If he says: "I would rather be a bus driver than a plumber because it's more challenging," that is an intrinsic response and would be scored IM. The scoring system was derived empirically on the basis of factor analyses of free responses given by hundreds of individuals.

The most recent form of the Choice-Motivator Scale is a picture scale (Picture Motivation Scale) developed by David Kunca and Nancy Haywood (who, no, is not my daughter) which was designed specifically for use with individuals of low mental age, either very young children or retarded individuals. With the Picture Motivation Scale, the child sees two pictures on a screen, side by side. As the child is shown the first item, the examiner says: "Here is an astronaut going to the moon. Over here is somebody staying on earth. Would you rather be an astronaut and do something exciting like go to the moon, or would you rather stay on earth where you would be sure not to get hurt?" An exact

replica of what is on the screen appears on a sheet placed in front of the child. The child then points or marks the picture of his choice on the sheet. As on the Choice-Motivator Scale, there are twenty items, each one contrasting an IM choice with an EM choice and combining choice of activity with reason for choice.

I would like to tell you about three pieces of research out of the three dozen or so that we have done with that system. The first piece of research will illustrate a couple of points. Joe Weaver, another one of my former graduate students, and I gave the Choice-Motivator Scale to mentally-retarded individuals at Southbury Training School in Connecticut and then selected those who had high scores on the task extrinsic (the EM dimension) and those who had not so high scores on that dimension (Haywood and Weaver, 1967). One of the reasons I can't say that they had high IM scores is that you don't find high IM individuals in institutions for the mentally retarded or in any other kind of institutional setting. The IM-ness is squeezed out of them by the system. We gave all the subjects a simple motor task but broke each group (IM and EM) into four subgroups. In Subgroup 1, we said: "If you do very well on this task, you'll get ten cents." In Subgroup 2, we said: "If you do very well on this task, you'll get one cent." In Subgroup 3, we said: "Do as well as you can." In Subgroup 4, we said: "If you do very well on this task, I'll let you do another task." We then gave four trials with whatever had been promised being presented at the end of each trial. The relatively IM children performed best under the condition which said: "If you do very well, I'll let you do another task," (task-incentive condition); and their performance was significantly better under that condition than was that of the EM children under the same condition. The EM children did the most work under the ten-cent incentive condition and performed better under that condition than did the IM children. These results seemed to indicate to us that the personal motive system of the individual must be matched with the incentive that you offer him.

Now, let me tell you about some more psychometric sorts of things. We've touched upon class differences during this Conference, but have completely skirted the issue of race differences, even though Jensen has been mentioned a couple of times. Let's look now at some of those things head on.

In Nashville, Tennessee, we have an almost unique opportunity to study the interaction of race and social class, both with respect to IQ scores and with respect to motivation. The next study described was done partly as a test of the notion that much of what has looked like ability deficits may turn out to be motivational deficits. Nashville is almost unique because it has had, for at least three generations, a substantial black middle class that cannot be characterized as nouveau rich. This may be due to the presence of Fisk University and Meharry Medical College, both black institutions, and a substantial black business community. They have become accustomed to "middle-classness" over the last two or three generations and are somewhat more like the white middle class than the "first-generation rich." We have given intelligence tests and the Choice-Motivator Scale to children, black and white, in

grades four, six and eight, in middle class and lower-class groups (Call, 1968). The results may be seen in Figure 1.

Figure 1

I want you to notice that a developmental phenomenon occurred in the black middle-class group, such that in the fourth grade there was a large difference between the white middle class and the black middle-class children. By sixth grade, and continuing to eighth grade, that difference was not statistically significant. I'm aware of my inability to prove the null hypothesis, but at least a difference that was there at grade four could not be detected at grades six or eight. The other aspect of these IQ data that I'd like to point out is that the social-class difference contributed substantially more to the total variance than did the race difference. In the analysis of variance or IQ, the variance components could be ordered according to their relative contribution to the total. Social Class provided the largest source of variance (F = 283.43, 1/456 df, $p<.001$); the second largest source was Race (F = 111.78, 1/456 df, $p<.001$); and the third largest contributor to the total variance was Grade Level (F = 18.18, 2/456 df, $p<.001$).

I want you to keep Figure 1 in mind while you look at Figure 2, which shows the scores obtained on the Choice-Motivator Scale. The analysis of variance performed on the IM scores showed that the three main effects in the IQ analysis of variance were again significant at the .001 level; and as you can see, the IM curves are remarkably parallel to the IQ curves in Figure 1.

Figure 2

Another interesting observation is that within the middle-class groups the black children and the white children were very much alike on the motivation dimension by the sixth grade. Within the lower-class groups, the difference was just as large by eighth grade as it was in fourth grade. Thus, there was an interaction between race and social class that one is hard pressed to explain; but some speculations can be made. My speculation goes like this: In middle-class groups, there is more and earlier interaction between black and white children. There is more of a feeling among, and more teaching to, middle-class children that they are, in fact, worthy persons and are at least equal in every respect to every other person. In addition, the middle-class children see evidence of this. In lower-class groups, the spontaneous, if not actually socially reinforced, patterns of segregation still exist, even in the "Upper South"; and I think there is much less black-white interaction among lower-class children than among middle-class children.

We also did two analyses of covariance on these data. The first one was done because we thought that there was a low but statistically significant correlation between motivation scores and IQ. When IQ was held constant statistically, all the differences that were present in the motivation curve (Figure 2) were still there.

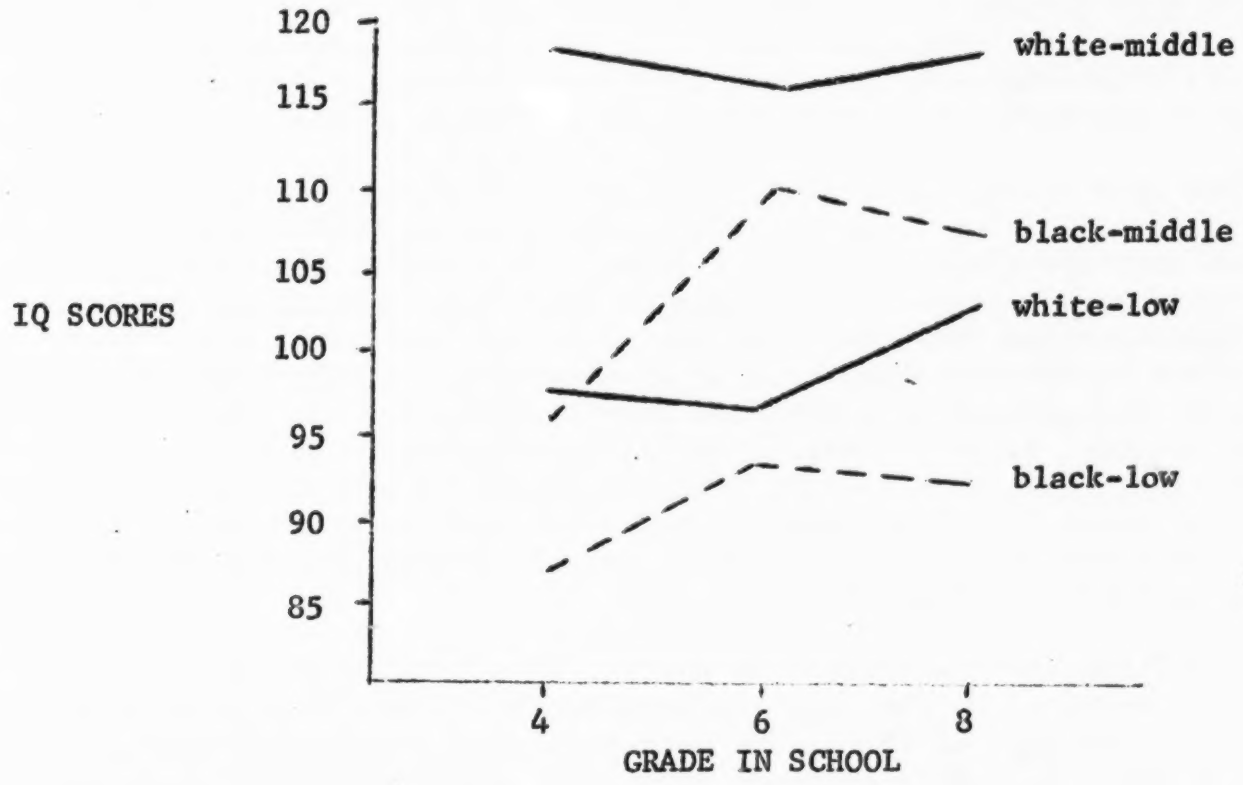
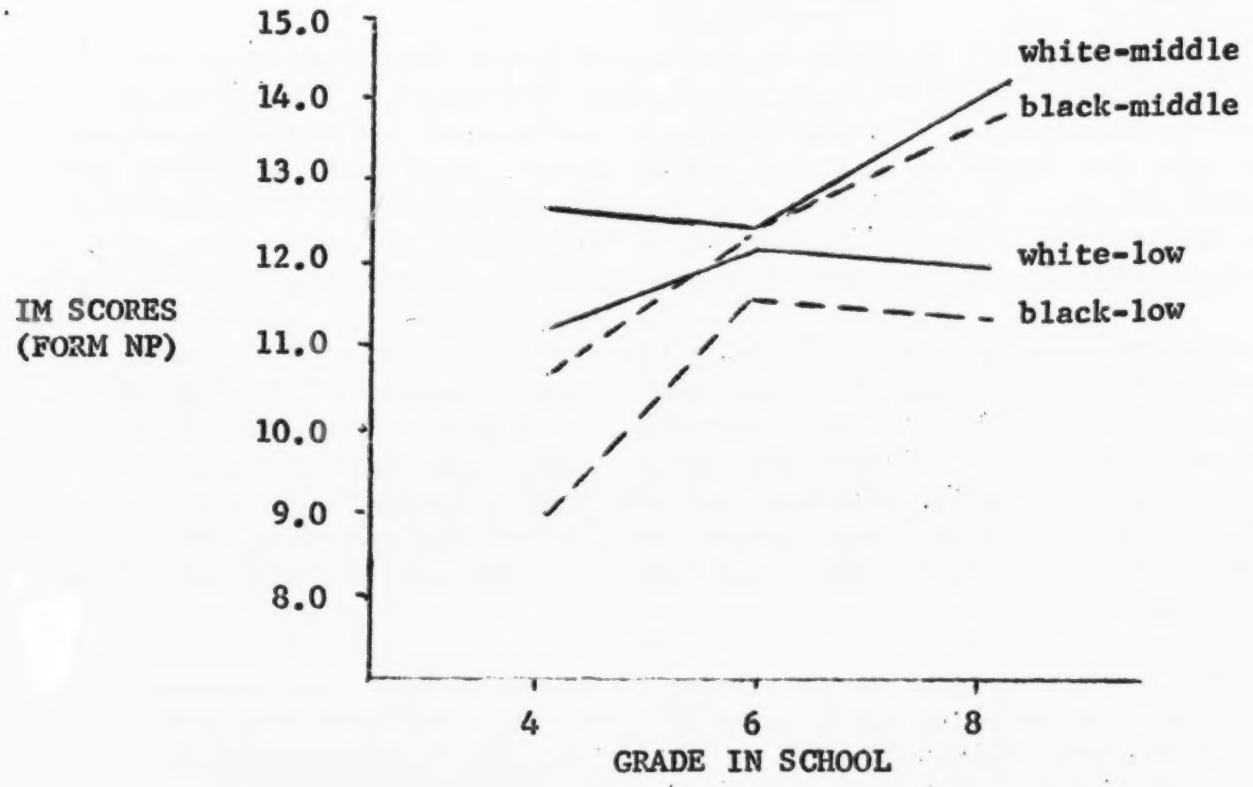


Figure 1 (Haywood). IQ scores as a function of grade, race and social class (Reprinted from Call, 1968).

Figure 2 (Haywood). IM scores as a function of grade, race and social class (Reprinted from Call, 1968).



We then turned the picture around and analyzed the IQ data while making covariance adjustments for individual differences in motivation. This analysis indicated that when individual differences in motivation were held constant the IQ curves for the two races were closer together.

The last study I want to discuss has to do with pre-school children, in fact, Head Start children (Haywood, Kunca and Haywood, in preparation). We gave the Vane Kindergarten Test (Vane, 1968) and the Picture Motivation Scale to an entire rural Tennessee Head Start population and to Peabody Demonstration Pre-School children four and five years old. The difference in socio-economic status was enormous. At the time, the criterion for getting into the Head Start program was that family income had to be under $3,000 a year. The Peabody Demonstration Pre-School, on the other hand, is a private school operated by Peabody College on a tuition basis. Fees are sufficiently high that it would be quite unlikely that any family with an annual income of less than $10,000 could afford to send children there.

The first thing we looked at was IQ. The mean IQ in the Head Start group, as measured by the Vane Kindergarten Test, was 89.7, with a standard deviation (SD) of 15.4. The mean IQ of the Peabody Pre-School children was 115.3 (SD = 12.8), a very large difference. The Vane consists of a Perceptual Motor Test, a Vocabulary Test and a Draw-a-Man Test. The greatest difference between the two groups occurred on the Vocabulary Test, where the Head Start children had a mean score of 90.3 and the Peabody children had a mean of 123.9. The Peabody children did much better on the Vocabulary Test than on the other two components of the Vane, with mean scores of 109.4, 111.9 and 123.9, respectively, on the Perceptual Motor Test, Draw-a-Man Test and Vocabulary Test, while the Head Start children showed about equal performance on all three components (90, 88.6 and 90.3, respectively).

With the Picture Motivation Scale, we found the Head Start children to be significantly more extrinsically motivated. They responded more often to questions by indicating a preference for avoiding effort, for safety, for security and for making money, as opposed to doing interesting things. By contrast, the Peabody children had significantly higher IM scores. These differences in motivation remained even when individual differences in IQ were held constant statistically.

An additional reason for paying attention to these differences in motivation is that, using the same set of constructs, we've been able to show that IM children show significantly higher achievement levels in school than do EM children who are matched with them on age, sex and IQ (Haywood, 1968). Further, we are seeing those differences in achievement as early as first grade; and, if we had adequate achievement measures, I think we could measure motivational orientation before first grade.

I wanted to suggest to you those things that might be relevant to early-education efforts, particularly when those efforts are directed toward culturally disadvantaged and/or apparently intellectually-retarded children. Simply to reiterate, apparent intellective and cognitive deficits may be attributable in some measure to differences

in motivational structures; and I do believe that we have some evidence that these are learned rather than genetic differences in personality and motivational orientations. Being also, with Dr. Homme, a Guthriean, I would insist that anything that is learned can be unlearned and that unlearning can occur by the substitution of an incompatible response to the same cues. We have tried shifting children's motivational orientations and have been successful in doing so.

Discussion from Panelists.

Dr. White:

I am very pleased, not only with the quality of the work that Dr. Haywood is doing, but especially with the topic. I think the topic of motivation has been badly neglected. We skirt that issue repeatedly. It's a tough one to deal with in psychological and educational research, but it's my suspicion that it will provide great benefits.

Here are two points. I think the value of specific achievements, whether it be the use of the hand as a reaching instrument, or reading, or whatever, is secondary in its importance in these early fast-moving years to whether or not in the process of achieving these specific landmarks, the child is really making any gain in intrinsic motivation. I'm interested in the fact that the children achieve reaching earlier under play conditions, primarily because they seem to get a heck of a bang out of it and it seems to be consistent with their interest and exploratory activities in general. And I think, if you teach reading to a two-year old or a four-year old and he gets a great kick out of it and it doesn't take away from the rest of his life in waking hours and it's consistent with the notions of sponsoring intrinsic motivation, that's fine. If you achieve it at the cost of driving a mother to suicide and a child to distraction, then I think you're in trouble. But that, of course, is just a hunch. That's an interpretation.

The second point is that, probably, most of the successful compensatory or noncompensatory early-education efforts in the recent past have all played that tune. They've all worked on intrinsic motivation and intrinsic interest. I think, perhaps, the trick in being successful with the Bereiter system is to have teachers skillful enough so that learning is not merely drill; but it's doing something systematic that holds the interest of the child. If the child perceives learning as an interest-grabbing situation, rather than one that pays off only in M&Ms, or one motivated by fear, then I think you've got something. This is consistent with a number of other studies of a tutorial kind.

Dr. Bereiter:

Yes, I, too, am very glad to know of the really penetrating work that Carl Haywood is doing on what has to be a really very important aspect of motivation. And I am particularly pleased that, having carried out the research that demonstrates a trait that interacts very importantly with task performance and with global measures of intelligence, he is now proceeding to see whether it is a changeable trait. It is at

that point that you start getting down to an educational issue. How changeable it will be is another matter. I'm inclined to be optimistic on this, and I think Carl Haywood is as well.

But, I think, perhaps, there has been some undue optimism about motivation, the idea being that, well, if you can explain performance differences on the basis of motivation, then it goes without saying that that's modifiable. It doesn't go without saying. As a matter of fact, if you want to take a really hard line on this point, you could require the investigation of the heritability of intrinsic motivation. You see, intrinsic motivation could well be the heritable component or one of the major heritable components of intelligence. In fact, Keith Haze, in his article of almost ten years ago on genes, drives and intelligence, argued this very point in considerable detail, although with generally only indirect evidence. As to the ways in which motivation could be modified, I certainly want to hear all of Carl Haywood's views.

I would agree that motivational changes have played an important part in the effects of our program. All right, you have to be motivated to do the task that leads to cognitive growth; but, on the other hand, you have to know something in order to have the motivation. One of the things you have to know, for instance, to be intrinsically motivated, is that success lies around the corner. You have to know something about learning taking place. One of the reasons we had to go to raisin rewards and things of this sort was that, although children new to the program spent four years learning something every few minutes, they weren't aware they had learned. They had not been taught; and so, as you started them in on tasks, they had no idea where the task was going to lead them. They had no idea that tomorrow they would be able to do something that they couldn't do today; and in order for them to find that out, you had to get them to learn first. That was the reason for the raisins. In other words, start out with whatever will work to get them to go through the necessary motions in order to learn; but once they've learned, they have the data from which to develop an interest in the intrinsic properties of the whole learning phenomena. So it's not a simple matter, but I think there's a lot in there that can be played with and a lot that people can do with it.

Dr. Haywood:

Dr. Bereiter has touched upon some very important issues. It seems to me that the reason there is a significant correlation between intrinsic motivation and IQ is that motivation has a hell of a lot to do with competence, that there is no joy in learning if one is incompetent at learning. The situation has to be developed. In the case of the mentally-retarded child, for example, he meets frustration as he begins to attempt to manipulate his world. It is not rewarding to engage in exploratory and manipulative behavior when one fails every time he does it. So the child learns. That situation doesn't keep him from learning; he does learn. But <u>what</u> he learns is <u>not</u> to explore, <u>not</u> to try new things, <u>not</u> to attempt to manipulate his environment because it's only going to result in another failure. Now, how do you get around that?

Well, one way you can get around that is to identify the dominant motivational system in the individual child; and then you pay him off for task-intrinsic behavior with task-extrinsic rewards, if his motivational system is task extrinsic. You pay him off with a motivationally-relevant reward. Then, you gradually fade out the extrinsic reinforcers. You quit giving him M&Ms and money and things like that, gradually, a certain percentage of the time, and substitute task-intrinsic rewards, even as simple minded as, "If you do this, I'll let you do another one," until the association between rewarded behavior and task-intrinsic behavior becomes established.

We have tried to do this in a number of ways. In one setting, we selected six retarded adolescent boys, the worst-behaved individuals we could find in the institution. We had no controls. We began with a verbal conditioning technique in a group setting. Every time they said something that was related to comfort and security and ease and avoidance of effort, they were ignored, which was pretty hard to do. Every time they said something that was related to task achievement, to effort, to responsibility, to challenge, to creativity, they were praised. Well, as you all know and can predict without a moment's hesitation, in that kind of situation, the frequency of task-extrinsic verbalizations dropped down to practically nothing; and the frequency of task-intrinsic verbalizations went up greatly. At the point at which those two kinds of verbalizations approached an asymptote, we were in the same dilemma in which verbally-oriented psychotherapists always find themselves. The question is: "Now that I've changed verbal behavior within the therapy setting, have I changed nonverbal behavior; and have I even changed verbal behavior outside the therapy setting"?

We then moved to the occupational therapy shop, which, incidentally, I think is a mighty powerful tool, a kind of work therapy. In the shop, we rewarded task achievement oriented behavior. If a boy picked up a saw and approached a piece of wood, he was rewarded both verbally and with task rewards of this nature. Any time he did something that looked like it was focused toward the achievement of a task, he was immediately assigned a slightly higher level responsibility. For example, we would say: "Would you please measure the board and decide where it goes in this bookcase we're making"? The ultimate level of responsibility was to teach other people in the group how to do the skill.

The outcome for these boys was a marked decrease in the occurrence of disruptive behavior in the institution, that is, stealing, sexual acting out, running away, setting fires, and that sort of thing. In addition, there was a marked increase in the ratings they received from supervisors on their job placements within the institution. Even though we had no control group, I think this sort of thing indicates that shifts in motivation can occur; and I would just suggest this kind of paradigm as a way to start looking at how it can be done.

Dr. Homme:

For me, the really exciting thing about Carl Haywood's research is not the fact that you can classify people in different ways and then

predict who are going to be the failures. That leaves me cold. That's educational research for the past couple of hundred years, I suppose. What is really exciting is the fact that we're now ready to zero in on changing EMs into IMs, which is precisely what you do routinely. I disagree that it's a complicated and difficult matter. I think it's a cinch. We have the technology right now to turn an EM into an IM; and we do it with beginning readers, for example. Those kids who are beginning to learn to read haven't the slightest interest in what makes the "kuh" sound. What they're interested in, at first, is the little blue car or the whistle they're going to get to blow. But inevitably, and it always happens, if we do our job correctly, reading becomes a reinforcing event, so that when they get back to the play area and we say: "You can do anything you want now," the child will say: "I want to finish that story I started," which, I think, is a classical IM response. So I think we've got a technology. All we need to do is put it to use. But I'm afraid that's not going to happen for twenty years or so. Well, things are happening faster now. It'll happen in ten years, even though we got it yesterday.

Dr. Schaefer:

The work of Dr. Haywood and that of Dr. Bereiter are highly related because teaching the logic of thinking and discovery to children must lead, I think, to this intrinsic motivation. I am reminded of an experiment by Judy Rubenstein. She looked at mothers of infants and determined how much attention the mothers were giving the children. She then placed a familiar and a novel toy before the children and saw that children who had received much attention picked the novel toy, and children who had received little attention picked the more familiar toy. So maybe you can get intrinsic motivation already in infancy out of this positive kind of relationship and experience, which, of course, may be related to Piaget's statement that the more a child is seen and heard, the more he wants to see and hear. That again may be part of the beginnings of intrinsic motivation. So, I think this is an extremely fruitful and exciting field of research; and I think we are going to have to go into this kind of variable, as well as our cognitive measures in order to really understand what's happening in early education.

Just as an attempt to wrap together some of the themes of this Conference, I generated a statement that says: "Maybe through the development of positive relationships and through learning the joy of thinking and discovery, we could teach children intrinsic motivation, as well as some skills."

Questions from the Audience.

Question:

Dr. Haywood, your motivational concept seems very closely related to Dr. Homme's contingency contracting. When you were working with your institutionalized boys, were they consciously aware of the contracting that was going on?

Dr. Haywood:

I have no way of measuring awareness, but they were not told.

Dr. Bereiter:

Dr. Haywood, I wonder if we might give just a minute's reflection to what we've been doing in elementary school, junior high, senior high and college in extrinsic motivation, and whether this has any effect upon the kind of teachers we have produced. I am referring to the matter of rewarding with grades or punishing with grades, and whether this has any relevancy to part of our problem.

Dr. Haywood:

Yes, I think it does. In one doctoral dissertation in special education that was done at Peabody, the Choice-Motivator Scale was given to junior high school, educable mentally retarded children. We noticed that the mean Choice-Motivator Scale scores tended to run by classes, that there tended to be relative homogeneity within classrooms. We wondered why that should be so. One explanation centered on the fact that Nashville's ungraded classes are likely to have the same teacher with the same children for two or three years. We wondered it if might not be that children's motivational orientation is learned and/or is influenced rather greatly by the teacher. So we went back and asked the teachers to take the Choice-Motivator Scale, and we did find some degree of correspondence between the teachers' scores and the mean score in the class. I don't know who influenced whom, but it was there. I wonder now if we can't even devise a technology for motivator therapy for special-class teachers, or for all of our teachers. That might be useful.

I get very upset every time I see a favorite advertising activity of the government. They are trying to motivate kids to stay in school; and so you see a newspaper ad that says: "Stay in School," or some equally obvious thing. Underneath it, it says: "A person with a high-school diploma makes $50,000 more in his lifetime than a person without one. A person with a college degree makes $100,000 more in his lifetime than does a person without one. . ." and so on. The whole basis of the thing is task extrinsic. Those advertisements never say a thing about the intrinsic joys of learning. It's just wrong.

Question:

You mentioned that there were IM and EM types of people. Are there IM and EM types of tasks, too? And if so, can children agree pretty much what's an extrinsic type of task, the "kuh" sound for example?

Dr. Haywood:

That's one of the things that we are currently testing. No, there are not IM and EM tasks. There are IM and EM motives. You can do the same task for either an intrinsic or extrinsic reason. This particular set of concepts refers to reasons for choosing a particular activity,

not to the choice of activity. It's only in the low MA scale that we've combined choice with reason for choice because the task is rather complex for a child to sort out otherwise. Now, we're using the verbal conditioning paradigm to study whether children can easily discriminate IM from EM kinds of statements. The task presents two cards simultaneously with a sentence on each card. One sentence in each pair characterizes IM and the other EM. We are differentially reinforcing IM and EM choices. I hope to know by the time I get back whether we have learning curves. If we have learning curves, then, yes, children can discriminate. If we don't, we don't know.

Dr. Blount:

Thus, the Early Childhood Intervention Research Conference comes to an end. I would like to again thank the panel for their participation and the audience for theirs.

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